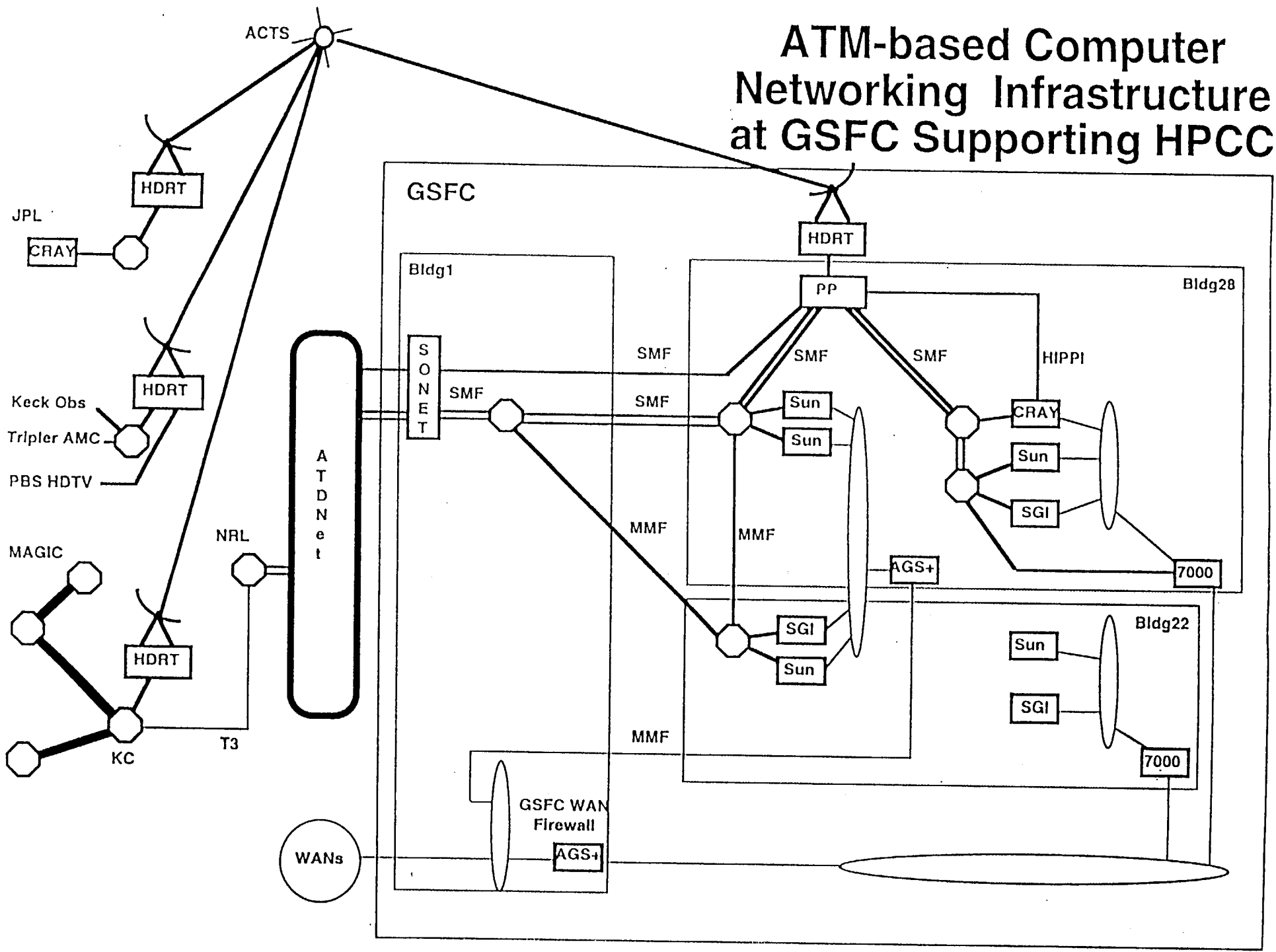
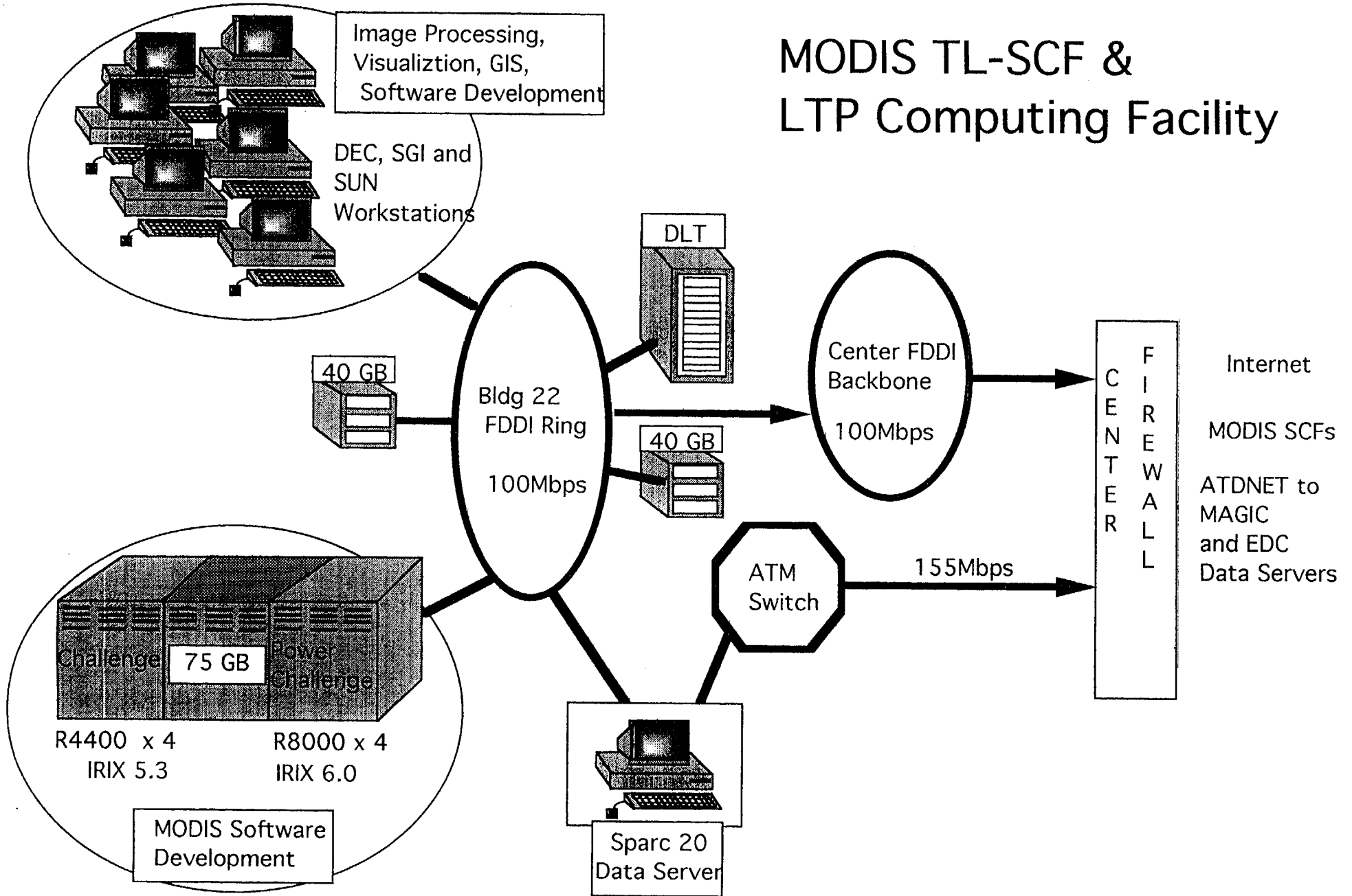


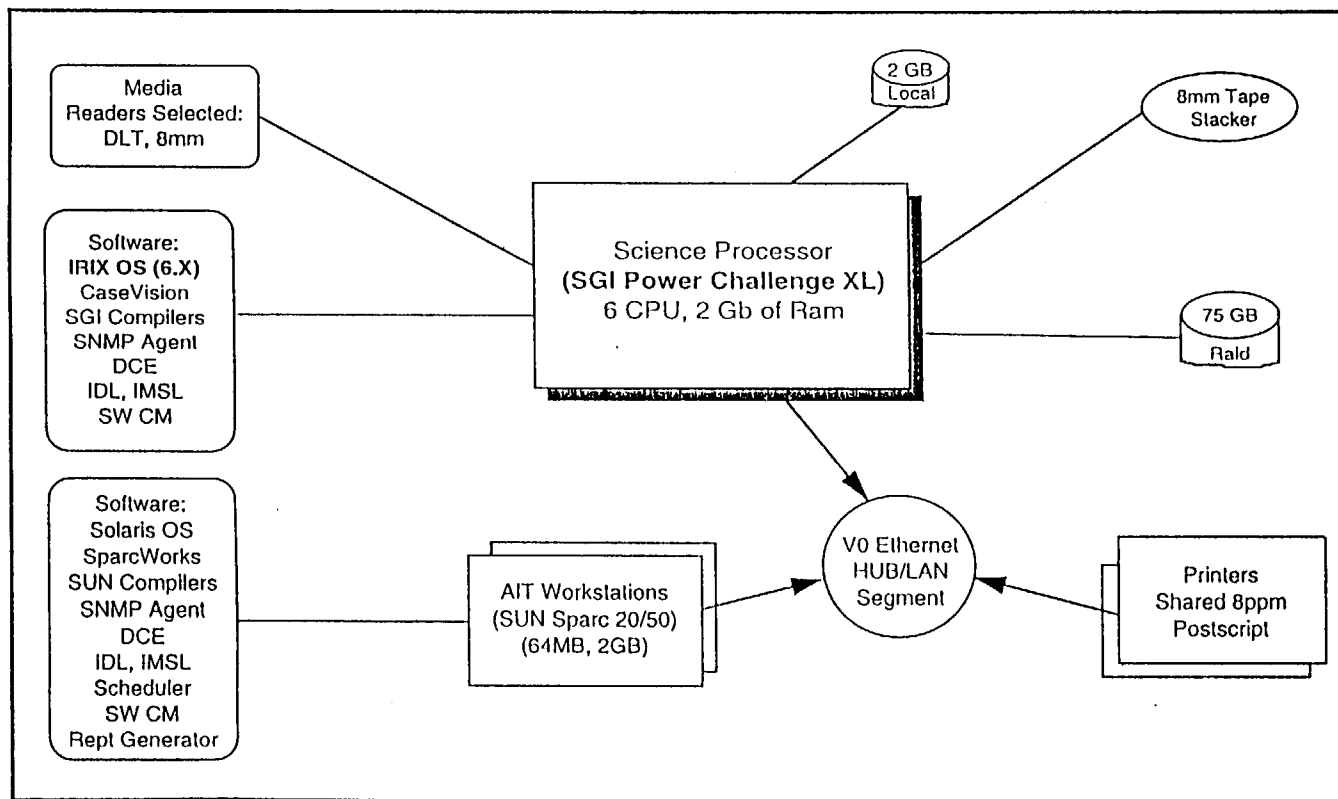
# ATM-based Computer Networking Infrastructure at GSFC Supporting HPCC



# MODIS TL-SCF & LTP Computing Facility



# Proposed IR-1 COTS Architecture GSFC DAAC



# Appendix H. Data Production Processes for TRMM and AM-1 Instruments (Draft)

Version 3.0 (Prepared 4/3/95)

Process ID	Process Name	Epoch	Inst	Output Prod ID	Proc Level	Proc DAAC	# of Runs per Period	Volume per Process (MB)	Vol/day (GB/day)	# of Ops/Proc (MFLOPs)	Proc Load (MFLOPs)	Process ID Given By Instrument Team
MOD_PR01	Level 1A Raw Counts	1/98 - 12/99	MODIS	MOD01	1A	GSFC	586 / day	196.755	115.200	14757	100.003	MOD01:L1A:C
MOD_PR02	Level 1B Calibrated Radiances	1/98 - 12/99	MODIS	MOD02	1B	GSFC	586 / day	307.942	180.300	191836	1300.000	MOD02:L1B:C
MOD_PR03	Level 1A Geolocation	1/98 - 12/99	MODIS	MOD03	1A	GSFC	586 / day	23.000	13.467	6050	40.999	MOD03:L1A:C
MOD_PR04	Level 2 Aerosol	1/98 - 12/99	MODIS	MOD04	2	GSFC	293 / day	3.728	1.092	184	0.624	MOD04:L2:C
MOD_PR04A	Level 3 Daily Aerosol	1/98 - 12/99	MODIS	MOD04	3	GSFC	355 / day	3.456	1.227	39	0.160	MOD04:L3:DY:C
MOD_PR04B	Level 3 Weekly Aerosol	1/98 - 12/99	MODIS	MOD04	3	GSFC	355 / 7-day	3.456	0.175	19	0.011	MOD04:L3:WK:C
MOD_PR04C	Level 3 Monthly Aerosol	1/98 - 12/99	MODIS	MOD04	3	GSFC	355 / 30-day	3.456	0.041	11	0.002	MOD04:L3:MN:C
MOD_PR05	Level 2 Near IR Precipitable Water	1/98 - 12/99	MODIS	MOD05	2	GSFC	293 / day	37.912	11.108	28	0.095	MOD05:L2:C
MOD_PR06	L2 Cloud Product	1/98 - 12/99	MODIS	MOD06	2	GSFC	586 / day	17.522	10.259	10705	72.544	MOD06:L2:C
MOD_PR06A	L3 0.5 deg Monthly Cloud Climatology	1/98 - 12/99	MODIS	MOD06	3	GSFC	355 / 30-day	0.029	0.000	110	0.015	MOD06:L3:MN:C
MOD_PR07	Joint L2 Process to Generate Products 07, 08, 30, and 38	1/98 - 12/99	MODIS	MOD07, 08, 30, 38	2	GSFC	586 / day	74.934	43.874	1476	10.002	MOD:ATMOS:L2:C
MOD_PR07A	Level 3 0.5° Monthly O3, PW, and Stability Index	1/98 - 12/99	MODIS	MOD07, 08, 38	3	GSFC	355 / 30-day	0.018	0.000	73	0.010	MOD:ATMOS:L3:MN:C
MOD_PR09	Surface Reflectances	1/98 - 12/98	MODIS	MOD09	2	GSFC	293 / day	141.000	41.313	2298	7.785	MOD09:L2:C
MOD_PR09A	Surface Reflectances	1/99 - 12/99	MODIS	MOD09	2	GSFC	293 / day	141.000	41.313	2298	7.785	MOD09:L2:E
MOD_PR09B	BRDF/ALBEDO	1/98 - 12/99	MODIS	MOD09	2	GSFC	355 / 9-day	1080.000	42.600	2803741	1280.000	MOD09:L2:C
MOD_PR10	Snow Cover	1/98 - 12/98	MODIS	MOD10	2	GSFC	293 / day	1.400	0.410	35	0.119	MOD10:L2:C
MOD_PR10A	Snow Cover	1/99 - 12/99	MODIS	MOD10	2	GSFC	293 / day	1.400	0.410	53	0.179	MOD10:L2:E
MOD_PR10B	Daily Gridded Snow Cover	1/98 - 12/99	MODIS	MOD10	3	GSFC	355 / day	1.440	0.511	18	0.076	MOD10:L3:DY:C
MOD_PR11	Level 2 Land Surface Temperatures & Emissivities	1/98 - 12/98	MODIS	MOD11	2	GSFC	586 / day	10.800	6.323	496	3.361	MOD11:L2:C
MOD_PR11A	Level 2 Land Surface Temperatures & Emissivities	1/99 - 12/99	MODIS	MOD11	2	GSFC	586 / day	10.800	6.323	640	4.337	MOD11:L2:E
MOD_PR11B	Level 3 Weekly Land Surface Temperatures & Emissivities	1/98 - 12/99	MODIS	MOD11	3	GSFC	355 / wk	12.000	0.609	147	0.086	MOD11:L3:WK:C
MOD_PR12	Land Cover Type (Provisional)	1/98 - 12/98	MODIS	MOD12	3	GSFC	355 / 3-mon	7.200	0.028	280338	12.798	MOD12:L3:3MN:C
MOD_PR12A	Land Cover Type and Change	1/99 - 12/99	MODIS	MOD12	3	GSFC	355 / 3-mon	43.200	0.170	280338	12.798	MOD12:L3:3MN:E
MOD_PR13	Vegetation Indices	1/98 - 12/99	MODIS	MOD13	2	GSFC	293 / day	54.000	15.822	1914	6.482	MOD13:L2:C
MOD_PR14	Level 2 Thermal Anomalies	1/98 - 12/99	MODIS	MOD14	2	GSFC	586 / day	2.700	1.581	24	0.160	MOD14:L2:C
MOD_PR14A	Level 3 Daily Thermal Anomalies	1/98 - 12/99	MODIS	MOD14	3	GSFC	355 / day	2.700	0.958	1242	5.101	MOD14:L3:DY:C
MOD_PR14B	Level 3 10 Day Thermal Anomalies	1/98 - 12/99	MODIS	MOD14	3	GSFC	355 / 10-day	2.700	0.096	27042	11.111	MOD14:L3:10DY:C
MOD_PR14C	Level 3 Monthly Thermal Anomalies	1/98 - 12/99	MODIS	MOD14	3	GSFC	355 / mon	2.700	0.032	736	0.101	MOD14:L3:MN:C
MOD_PR15	Leaf Area Index & FPAR	1/98 - 12/99	MODIS	MOD15	4	GSFC	355 / wk	3.000	0.152	124	0.073	MOD15:L4:WK:C
MOD_PR16	Evapotranspiration / Surface Resistance	7/98 - 12/99	MODIS	MOD16	3	GSFC	355 / wk	86.400	4.382	32710	19.200	MOD16:L3:WK:D
MOD_PR17	Weekly Photosynthesis-Respiration / NPP	1/98 - 12/99	MODIS	MOD17	4	GSFC	355 / wk	172.800	8.763	126	0.074	MOD17:L4:WK:C
MOD_PR17A	Annual Vegetation Production, Net Primary (NPP)	1/99 - 12/99	MODIS	MOD17	4	GSFC	355 / yr	TBD	TBD	0	0.000	MOD17:L4:YR:E
MOD_PR18	Ocean color algorithms, Level 2, at launch	1/98 - 12/99	MODIS	MOD18-27, 31, 36-37,39	2	GSFC	293 / day	167.890	49.192	82675	280.129	MODOCCLR:L2:C
MOD_PR18A	Equal area space bin for L2 ocean color algorithms.	1/98 - 12/99	MODIS	MOD18-27, 31, 36-37,39	3	GSFC	293 / day	21.660	6.346	16535	56.026	MODOCCLR:SPBIN:C
MOD_PR18B	Combine space binned files in one orbit	1/98 - 12/99	MODIS	MOD18-27, 31, 36-37,39	3	GSFC	16 / day	874.600	13.994	6192	1.147	MODOCCLR:ORBIT:C
MOD_PR18C	Combine all available orbital statistics to form daily composite	1/98 - 12/99	MODIS	MOD18-27, 31, 36-37,39	3	GSFC	1 / day	12682.000	12.682	12384	0.143	MODOCCLR:L3:COMP:DY:C
MOD_PR18D	Form weekly composite and reference fields	1/98 - 12/99	MODIS	MOD18-27, 31, 36-37,39	3	GSFC	1 / wk	12682.000	1.812	20640	0.034	MODOCCLR:L3:TMP:WK:C
MOD_PR18E	QC of daily and weekly composites	1/98 - 12/99	MODIS	MOD18-27, 31, 36-37,39	3	GSFC	1 / wk	25364.000	3.623	41280	0.068	MODOCCLR:L3:WK:C
MOD_PR28	Sea_sfc Temperature and Quality assessment Level 2, at launch	1/98 - 12/99	MODIS	MOD28	2	GSFC	586 / day	5.400	3.162	21630	146.579	MOD28:L2:C
MOD_PR28A	Equal area space bin for L2 SST.	1/98 - 12/99	MODIS	MOD28	3	GSFC	586 / day	1.354	0.793	10815	73.290	MOD28:SPBIN:C

## Appendix H. Data Production Processes for TRMM and AM-1 Instruments (Draft)

Version 3.0 (Prepared 4/3/95)

Process ID	Process Name	Epoch	Inst	Output Prod ID	Proc Level	Proc DAAC	# of Runs per Period	Volume per Process (MB)	Vol/day (GB/day)	# of Ops/Proc (MFLOPs)	Proc Load (MFLOPS)	Process ID Given By Instrument Team
MOD_PR28B	Combine space binned files in one orbit (day mode process)	1/98 - 12/99	MODIS	MOD28	3	GSFC	16 / day	27.335	0.437	8100	1.500	MOD28:D:ORBIT:C
MOD_PR28C	Combine space binned files in one orbit (night mode process)	1/98 - 12/99	MODIS	MOD28	3	GSFC	16 / day	27.335	0.437	8100	1.500	MOD28:N:ORBIT:C
MOD_PR28D	Combine all available orbital statistics to form daily composite (day mode proce	1/98 - 12/99	MODIS	MOD28	3	GSFC	1 / day	396.380	0.396	16200	0.188	MOD28:L3:COMP:D:C
MOD_PR28E	Combine all available orbital statistics to form daily composite (night mode pro	1/98 - 12/99	MODIS	MOD28	3	GSFC	1 / day	396.380	0.396	16200	0.188	MOD28:L3:COMP:N:C
MOD_PR28F	Form weekly composite and reference fields (day mode process)	1/98 - 12/99	MODIS	MOD28	3	GSFC	1 / wk	396.380	0.057	27000	0.045	MOD28:L3:TMP:D:WK:C
MOD_PR28G	Form weekly composite and reference fields (night mode process)	1/98 - 12/99	MODIS	MOD28	3	GSFC	1 / wk	396.380	0.057	27000	0.045	MOD28:L3:TMP:N:WK:C
MOD_PR28H	QC of daily composites and redetermination of weekly composite (day mode process)	1/98 - 12/99	MODIS	MOD28	3	GSFC	1 / wk	792.760	0.113	54000	0.089	MOD28:L3:D:WK:C
MOD_PR28I	QC of daily composites and redetermination of weekly composite (night mode proce	1/98 - 12/99	MODIS	MOD28	3	GSFC	1 / wk	792.760	0.113	54000	0.089	MOD28:L3:N:WK:C
MOD_PR29	Sea Ice Max Extent	1/98 - 12/99	MODIS	MOD29	2	GSFC	293 / day	2.700	0.791	24	0.081	MOD29:L2:C
MOD_PR29A	Daily Gridded Sea Ice Max Extent	1/98 - 12/99	MODIS	MOD29	3	GSFC	355 / day	4.320	1.534	18	0.072	MOD29:L3:DY:C
MOD_PR32	Match-up Databases Level 2, at launch	1/98 - 12/99	MODIS	MOD32	2	GSFC	1 / day	116.800	0.117	2	0.000	MOD32:L2:C
MOD_PR33	Gridded Snow Cover	1/98 - 12/99	MODIS	MOD33	3	NSIDC	355 / wk	7.200	0.365	34	0.020	MOD33:L3:WK:C
MOD_PR34	Gridded Vegetation Indices (Max NDVI & Integrated MVI)	1/99 - 12/99	MODIS	MOD34	3	EDC	355 / 10-day	17.300	0.614	27042	11.111	MOD34:L3:10DY:E
MOD_PR34A	Monthly Gridded Vegetation Indices (Max NDVI & Integrated MVI)	1/99 - 12/99	MODIS	MOD34	3	EDC	355 / mon	86.400	1.022	3504	0.480	MOD34:L3:MN:E
MOD_PR35	Classification Masks	1/98 - 12/99	MODIS	MOD35	2	GSFC	586 / day	5.416	3.171	8952	60.664	MOD35:L2:C
MOD_PR40	Level 3 Daily Gridded Thermal Anomalies Summary	1/99 - 12/99	MODIS	MOD40	3	EDC	355 / day	0.860	0.305	12	0.051	MOD40:L3:DY:E
MOD_PR40A	Level 3 10 Day Gridded Thermal Anomalies Summary	1/99 - 12/99	MODIS	MOD40	3	EDC	355 / 10-day	0.860	0.031	384	0.158	MOD40:L3:10DY:E
MOD_PR40B	Level 3 Monthly Gridded Thermal Anomalies Summary	1/99 - 12/99	MODIS	MOD40	3	EDC	355 / mon	0.860	0.010	117	0.016	MOD40:L3:MN:E
MOD_PR41	Land Surface Resistance Index	7/98 - 12/99	MODIS	MOD41	2	EDC	355 / day	81.000	28.755	789	2.673	MOD41:L2:D
MOD_PR42	Gridded Sea Ice Cover	1/98 - 12/99	MODIS	MOD42	3	NSIDC	355 / wk	7.200	0.365	1363	0.800	MOD42:L3:WK:C

# Peak DAAC-to-SCF Data Transfer

Prepared 2/28/95 (Revised 4/27/95)

Instrument	Source DAAC	Destination SCF	Peak Data Transfer (MB/day)	Comments
ASTER	EDC	TBD SCF(s)	1760.00	
CERES	LaRC	TBD SCF(s)	1.58	Total in-line QA output to be sent to TBD SCFs
LIS	MSFC	MSFC SCF	303.43	The size of L0 and L1-4 noticel files assumed to be 5 MB. It was also assumed that there would be significant errors for 10% of orbits and QA files would be generated.
MISR	LaRC	JPL SCF	18467.00 (164024.00)	The number inside the parentheses represents daily volume for non-electronic data transfer.
	LaRC	Muller	304.00 (34018.00)	The number inside the parentheses represents daily volume for non-electronic data transfer
	LaRC	Davies	377.00 (32711.00)	The number inside the parentheses represents daily volume for non-electronic data transfer
	LaRC	Ackerman	29.00 (47839.00)	The number inside the parentheses represents daily volume for non-electronic data transfer
	LaRC	Gerstl	304.00 (50021.00)	The number inside the parentheses represents daily volume for non-electronic data transfer
	LaRC	Sellers	27.00 (31309.00)	The number inside the parentheses represents daily volume for non-electronic data transfer
	LaRC	Gordon	27.00 (31309.00)	The number inside the parentheses represents daily volume for non-electronic data transfer
MODIS	EDC	GSFC SCF(s)	61100.05	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for validation
	EDC	CRSA (Boston)	42600.00	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for quality checks and validation
	EDC	UCSB	6931.97	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for quality checks and validation
	GSFC	GSFC SCF	369267.90	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for validation. For MOD06 (Cloud products), the estimate given by M. King (3.8 GB/day) was used instead of 100% of output data volume
	GSFC	U of Miami	113929.71	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for quality checks and validation
	GSFC	U of Wisconsin	23000.00	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for quality checks and validation
	NSIDC	GSFC SCF	2409.94	Following the MODIS SDST's recommendation, it was assumed that 100% of data would be transferred to SCFs for quality checks and validation
	GSFC	OSU	2936.00	Abbott's MODIS requirements
	LaRC	OSU	20.00	Abbott's CERES requirements
	JPL	OSU	50.00	Abbott's SWS requirements
MOPITT	LaRC	NCAR	721.50	
	LaRC	NCAR	255.20	MOPITT Level-0 data needed to be transferred for 5-day periods 4 or 5 times per year
	LaRC	U of Toronto	179.30	
	GSFC	NCAR	235.52	MODIS and DAO data needed by MOPITT team for five-day periods 4 or 5 times per year
	EDC	NCAR	33.77	MODIS data needed by MOPITT team for five-day periods 4 or 5 times per year

**Table 1. List of Updates and Description (Cont'd)**

Instrument	Number of Products		Product ID	Description
	(7/94)	(11/94)		

**List of Description of Changes -- MODIS**

Instrument	Product ID	Description of Changes
MODIS	All MODIS Products	<ul style="list-style-type: none"> <li>Incorporated the results of the ATBD peer review.</li> <li>Processing and storage requirements were revised based on AHWGP information.</li> </ul>
	MOD07	<ul style="list-style-type: none"> <li>Reclassified as interim product</li> </ul>
	MOD08	<ul style="list-style-type: none"> <li>Reclassified as interim product</li> </ul>
	MOD09	<ul style="list-style-type: none"> <li>All parameters except for 2015 were reclassified as research products</li> </ul>
<i>Research Product</i>	MOD14	<ul style="list-style-type: none"> <li>Horizontal resolution was expanded to include all five parameters of deleted MOD40</li> </ul>
	MOD15	<ul style="list-style-type: none"> <li>Product time frame was revised to PL.</li> </ul>
	MOD16	<ul style="list-style-type: none"> <li>Reclassified as research product</li> </ul>
	MOD17	<ul style="list-style-type: none"> <li>Reclassified as research product</li> </ul>
	MOD22	<ul style="list-style-type: none"> <li>Reclassified as validation product</li> </ul>
	MOD27	<ul style="list-style-type: none"> <li>Product time frame was changed to PL.</li> </ul>
	MOD30	<ul style="list-style-type: none"> <li>Reclassified as interim product</li> </ul>
	MOD31	<ul style="list-style-type: none"> <li>Reclassified as research product</li> </ul>
	MOD35	<ul style="list-style-type: none"> <li>Product Level was revised to 2.</li> </ul>
	MOD38	<ul style="list-style-type: none"> <li>Reclassified as interim product</li> </ul>
	MOD39	<ul style="list-style-type: none"> <li>Reclassified as validation product</li> </ul>
	MOD40	<ul style="list-style-type: none"> <li>Deleted and merged with MOD14</li> </ul>
	<del>MOD43</del>	<ul style="list-style-type: none"> <li>Reclassified as research product</li> <li>Changed Archival DAAC to EDC from GSFC</li> <li>Has been deleted from MODIS Product List.</li> </ul>

IACM - MODIS

Planned Capacity Increments			
Calendar Year	Processing MFLOPS	RAID Disk GB	Archive Storage TB
1994			
1995			
1996	4722.948	100.080	
1997	14168.844	300.240	
1998			251.141
1999	15856.240	370.439	231.311
2000	31589.120	700.690	231.311
2001			231.311
2002			424.071
Totals	66337.152	1471.449	1369.146

Planned Capacity			
Calendar Year	Processing MFLOPS	RAID Disk GB	Archive Storage TB
1994			
1995			
1996	4723	100	
1997	18892	400	
1998	18892	400	251
1999	34748	771	482
2000	66337	1471	714
2001	66337	1471	945
2002	66337	1471	1369

Requirement	
1x Processing MFLOPS	Data Volume TB
15743	135
15795	367
15795	598
15795	829
15795	1061

Cost by Fiscal Year					
Fiscal Year	Processing	RAID Disk	Archive	Maintenance	Totals
1994					
1995					
1996	\$1,742,239	\$450,810			\$2,193,049
1997	\$4,129,107	\$973,749		\$139,131	\$5,241,987
1998			\$5,947,334	\$501,273	\$6,448,608
1999	\$2,883,873	\$622,817	\$5,203,868	\$960,619	\$9,671,177
2000	\$4,538,795	\$848,207	\$387,979	\$1,563,249	\$7,338,230
2001			\$263,826	\$2,000,408	\$2,264,234
2002			\$328,903	\$2,098,670	\$2,427,573
2003				\$525,200	\$525,200
Totals	\$13,294,015	\$2,895,583	\$12,131,910	\$7,788,550	\$36,110,058