MODIS SCIENCE DATA SUPPORT TEAM

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Code 936
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MODIS SCIENCE DATA SUPPORT TEAM

OBJECTIVES:

To Support the MODIS Science Team Leader and Team Members in:

Developing

Integrating

Testing

Modifying

Maintaining

the MODIS Data Processing Software to Meet the Scientific Goals of the EOS.

MODIS SCIENCE DATA SUPPORT TEAM

TASKS:

1. Support Team Leader/Team Members to Develop Software.
2. Develop Other Required Software.
3. Develop Data Processing Procedures.
4. Integrate, Test, and Optimize TL/TM Developed Software.
5. Deliver Complete MODIS Data Product Processing Software System Along with Test Data Sets to EosDIS.
6. Modify and Maintain the Production Software.
7. Develop Product Validation Software.
8. Support Field Experiment and Near Real-Time Data Processing.

ACCOMPLISHMENTS

DELIVERED FOLLOWING REPORTS TO THE EOS PROJECT:

O	MIDACS Level-II Functional Requirements	(12/88)
O	MIDACS Operations Concept Document	(12/88)
O	MIDACS Specifications and Conceptual Design	(12/88)
O	MODIS-HIRIS Ground Data Systems Commonality Report	(12/88)
O	Data Packetization Recommendations Report	(9/89)
O	Core Data Product and Algorithm Report	(11/89)
O	Core Data Product Processing Scenarios Document	(11/89)
O	Post-Launch Data Processing Scenarios Document	(12/89)
O	MODIS SDST Requirements Document	(4/90)
O	MODIS Processing and Storage Requirements	(5/90)

PRESENTATIONS

"The Moderate Resolution Imaging Spectrometer (MODIS) Data System," ASPRS, Baltimore, MD, April 1989.

"Science Requirements on the MODIS Data System and Its Design Study," IGARSS "89, Vancouver, B. C., July 1989.

"Conceptual Plans for Producing Data Products from the Moderate Resolution Imaging Spectrometer (MODIS)," IGARSS '90, College Park, MD, May 1990.

"The Moderate Resolution Imaging Spectrometer (MODIS) Data System and Its Science Requirements," accepted for publication (IEEE Trans. Geos. and Remote Sensing).

DATA PROCESSING SYSTEM SIZE ESTIMATES

	HIRS	CZCS	AVHRR GAC	AVHRR LAC	MODIS-T	MODIS-N
PIXELS/SCAN LINE	56	1,968	409	2,048	1,007	1,582
SCAN LINE/SECOND	0.2	6.0	2	6	6.5	8
VISIBLE BANDS	1	5	2	2	32	17
INFRARED BANDS	19	1	3	3	0	19
BIT QUANTIZATION	13	8	10	10	13	12
VISIBLE COVERAGE	100%	8%	50%	10%	50%	50%
IR COVERAGE	100%	8%	100%	10%	0%	100%
VIS RATE (KBPS)	0.1	37.8	8.2	24.6	1,360.1	4,252.4
IR RATE (KBPS)	2.2	7.6	24.5	36.9	0.0	3,796.8
AVG RATE (KBPS)	2.3	45.3	32.7	61.4	1,360.1	8,049.2

RATIO OF MODIS TO HIRS	4,136
RATIO OF MODIS TO CZCS	208
RATIO OF MODIS TO AVHRR	100
RATIO OF MODIS TO ALL ABOVE	68

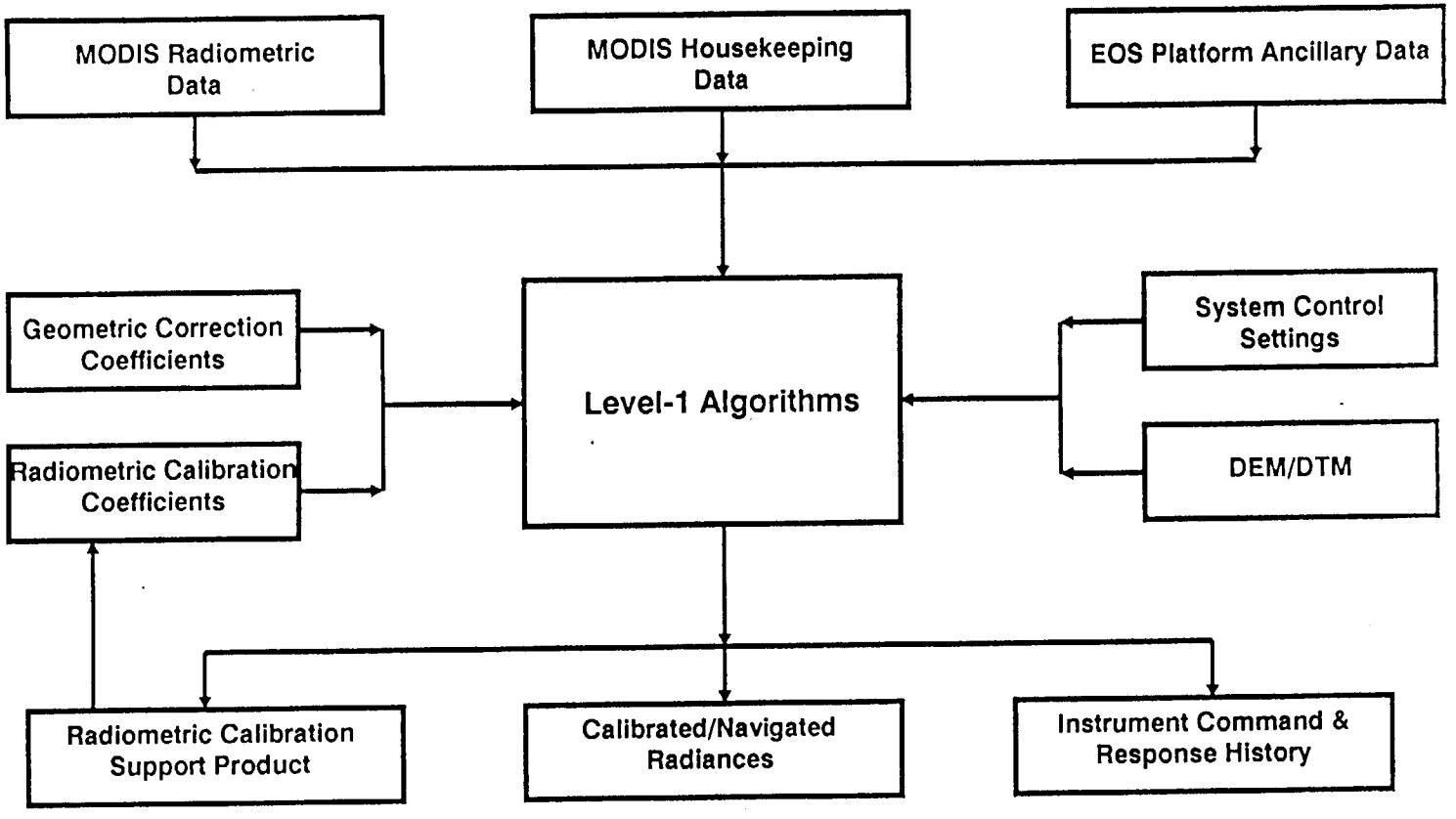
Data Attributes for MODIS vs. Heritage Instruments

PROCESSING REQUIREMENT IN MILLIONS OF FLOATING POINT OPERATIONS PER SECOND (MFLOPS) AS A FUNCTION OF PROCESSING LEVEL			
PROCESSING LEVEL	MFLOPS		MFLOPS
Level-1A	25.7	Reprocess*2	354.6
Level-1B	32.8	Near-Real-Time	17.7
Level-2 Ocean	23.3	Browse	3.5
Level-2 Land	7.9	Metadata	1.8
Level-2 Atmosphere	51.4	Maintenance	17.7
Level-2	87.4	Cntl/Shell	17.7
Level-3	31.4	Reserve	253.0
Subtotal	177.3	Total (Launch)	843.3

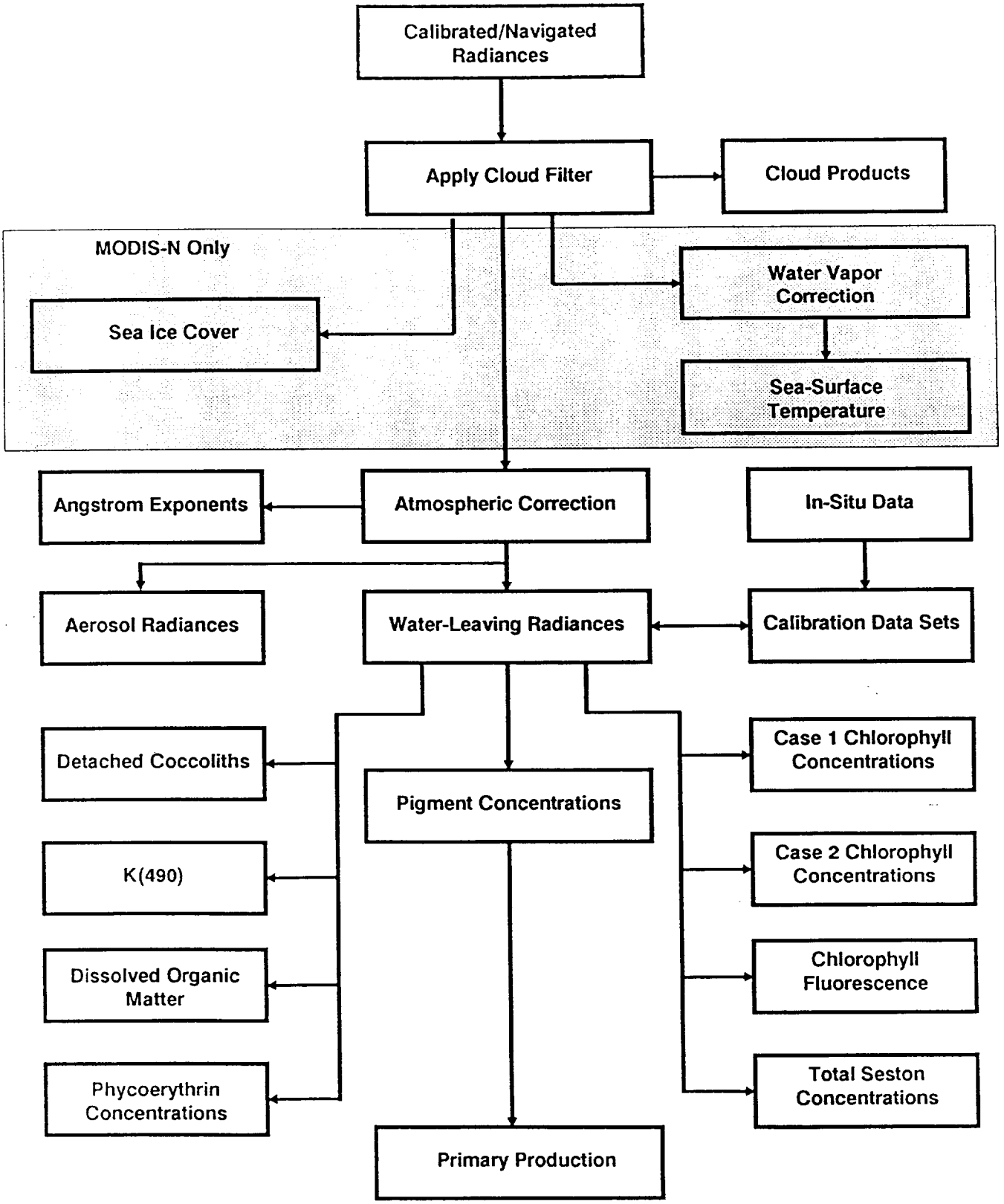
PROCESSING REQUIREMENT WITH LOC (INCLUDING COMMENTS) AS A METRIC AS A FUNCTION OF PROCESSING LEVEL		
PROCESSING LEVEL	LAUNCH LOC	GROWTH LOC
Level-1A	25,000	25,000
Level-1B	25,000	30,000
Calibration/Monitor	72,000	144,000
Level-2 Ocean	12,000	24,000
Level-2 Land	40,000	80,000
Level-2 Atmosphere	20,000	40,000
Level-2 Shell	30,000	30,000
Level-2 Utility	40,000	80,000
Level-2 IDS Products	36,000	72,000
Level-2 Total	178,000	326,000
Level-3	30,000	60,000
Near-Real-Time	17,800	81,500
Total	347,800	666,500

MODIS DATA PROCESSING FLOW

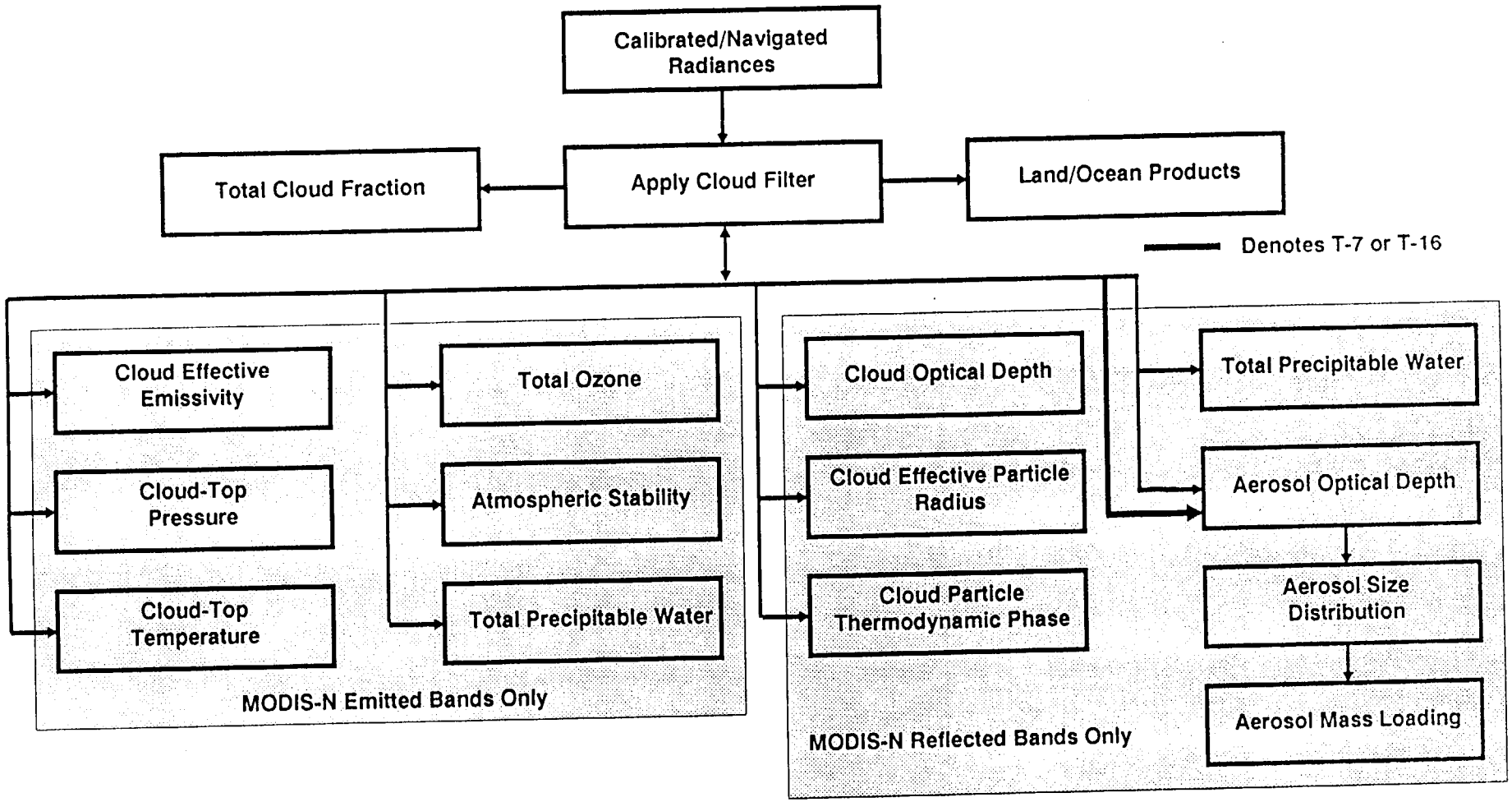
MODIS-N AND -T LEVEL-1 STANDARD PRODUCT PROCESSING SCENARIO



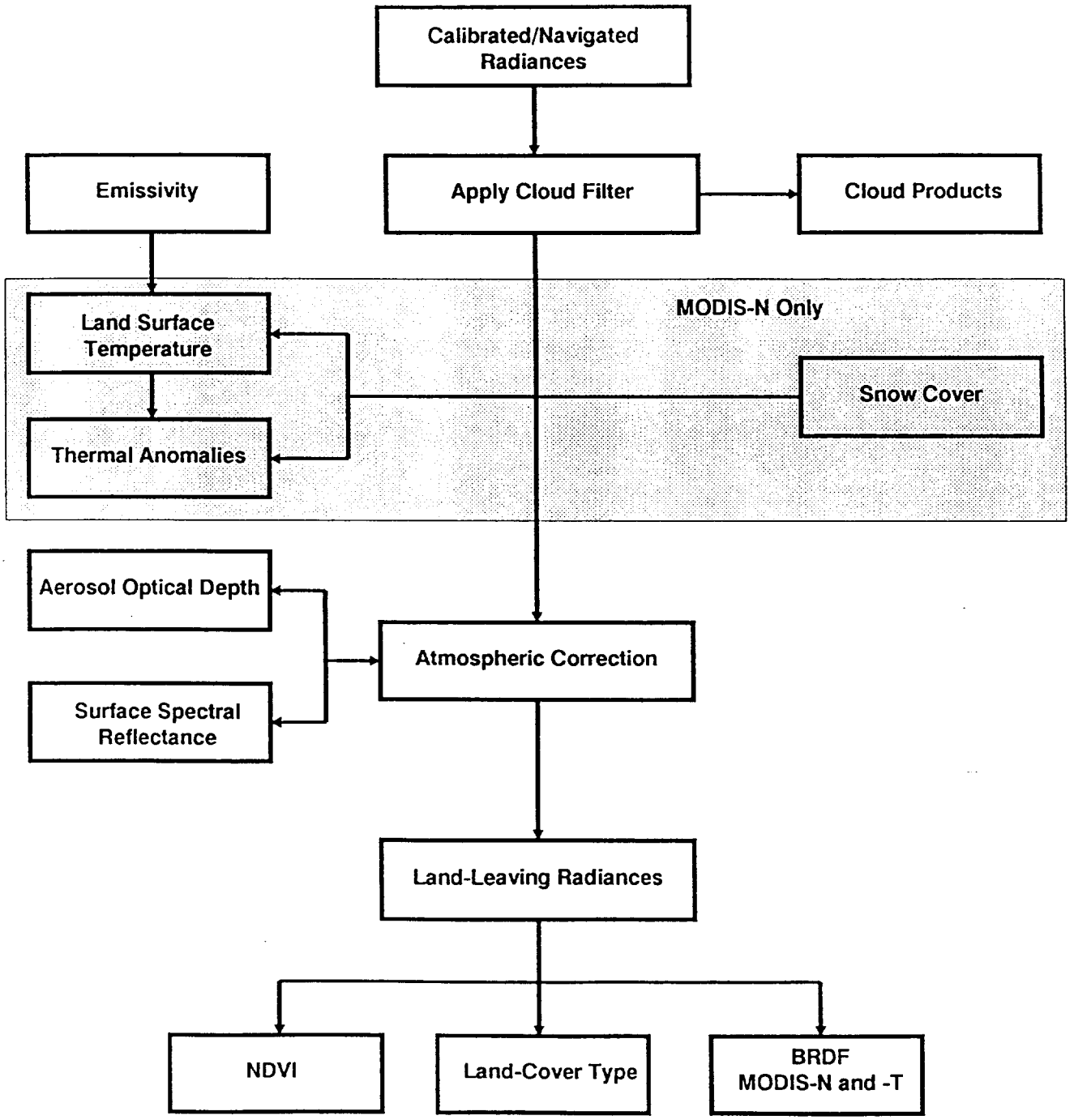
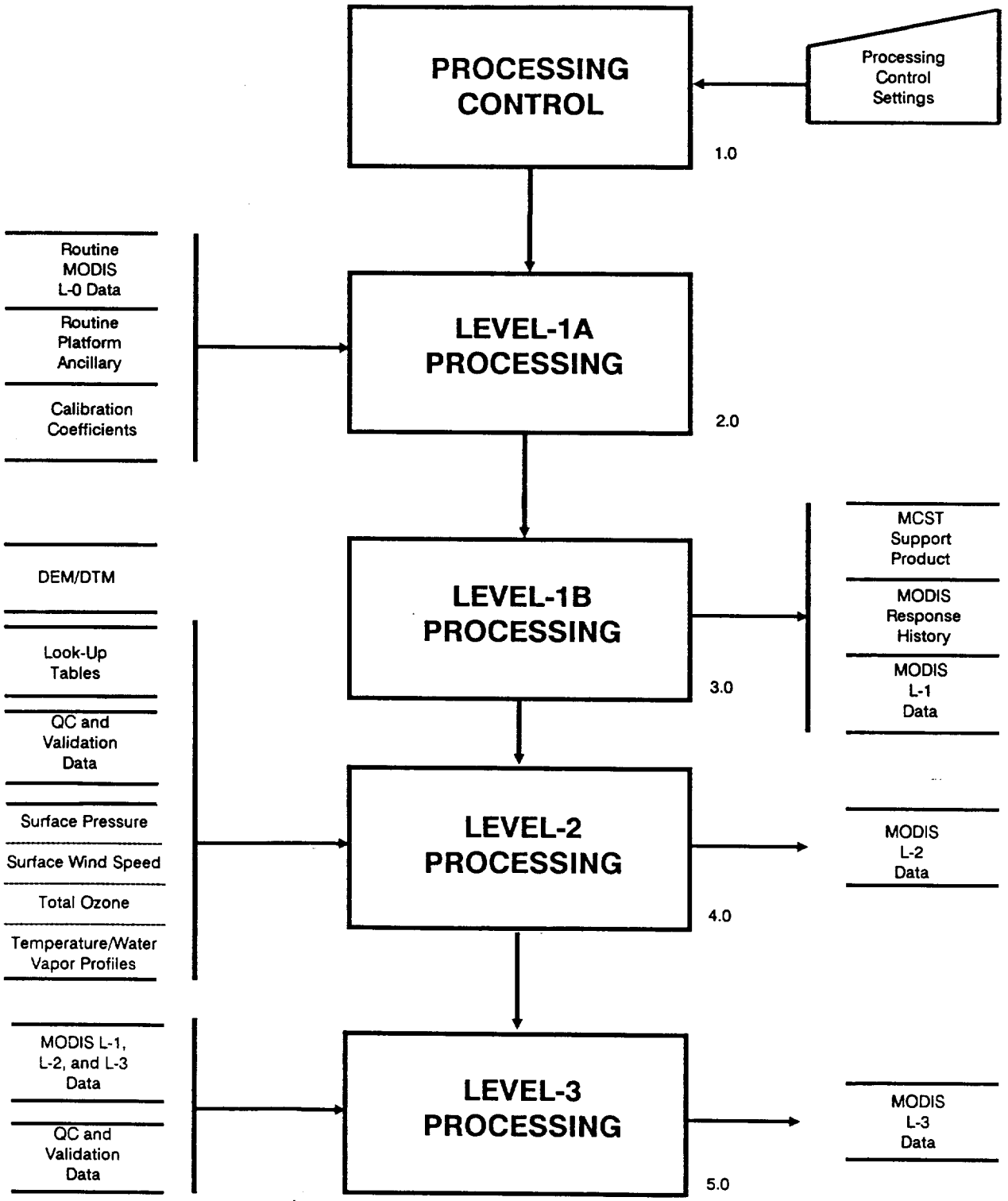
MODIS-N AND -T OCEAN STANDARD PRODUCT PROCESSING SCENARIO



MODIS-N AND -T ATMOSPHERE STANDARD PRODUCT PROCESSING SCENARIO



MODIS-N AND -T LAND STANDARD PRODUCT PROCESSING SCENARIO



DATA FLOWS FOR ROUTINE LEVEL-1 TO LEVEL-4 MODIS DATA PROCESSING