MODIS
SCIENCE DATA SUPPORT TEAM
PRESENTATION

June 12, 1992

AGENDA

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ACTION ITEMS:

06/05/92 [Lloyd Carpenter] Update the Team Leader's Software and Data Management Plan. (An updated version is included with the handout.) STATUS: Open. Due Date: 07/10/92

06/05/92 [Lloyd Carpenter] Update the Team Leader's Science Computing Facility Plan. STATUS: Open. Due Date: 07/10/92

04/24/92 [Tom Goff] Develop a detailed schedule through to the delivery of Version 1 to the DAAC for Level-1A and -1B software design and development, identification of risk areas in Level-1A and -1B design, and prototyping of risks. (A detailed draft list of tasks, risks, and a draft schedule were presented on 06/05/92.) STATUS: Open. Due Date: 05/22/92

04/24/92 [J. J. Pan] Develop a detailed schedule for a typical algorithm integration into the Level-2 processing shell. (A draft task list and schedule were presented on 06/05/92.) STATUS: Open. Due Date: 06/05/92

04/24/92 [Lloyd Carpenter & Team] Develop a staffing plan for the accomplishment of the tasks shown on the schedule. STATUS: Open. Due Date: 06/12/92

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The Log of the MODIS Level-2 Processing Shell Design

J. J. Pan
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Date: June 4 - June 11, 1992

6/4-6/5

1. Based on the abstracts of algorithms, group the 49 algorithms into three parts: (1) Atmospheric (15 algorithms), (2) Ocean (20 algorithms), and (3) Land (14 algorithms).
2. A lot of help received from Philip Ardanuy and Lloyd Carpenter during classification of algorithms and identification the discrepencies in the documents.

6/8-6/9

3. Start to design the flow charts of the atmospheric data processing. List and examine the input/output data of each algorithm and generate a table to identify their relationship.

6/9-6/10

4. Use this table to explore the following questions:
   (1) Which input data will be stored in a "common" area,
   Example: Data 2339 (Level-1B Radiance, MODIS-N<3um) and data 2340 (Level-1B Radiance, MODIS-N>3um) will be used for most of algorithms.
   (2) How to specify the order of algorithms which must be processed sequentially.
   Example: The Algorithm 524 (Aerosol Optical Depth) has to be processed before the algorithm 525 (Aerosol Size distribution).
   (3) Check the discrepency between input and output data,
   Example: The data 2126 (Cloud Emissivity) appeared in both input and output data in algorithm 533 (Cloud Effective Emissivity).
   -------- Tried to reach Dr. Menzel, but he was out of town.
   (4) What happen if one data product will be generated from two algorithms,
   Example: The data product 3322 (Precipitable Water) will be generated from algorithms 513 (Water Vapor) and 530 (Total Precipitable Water).
5. Check Science Processing DataBase (SPDB) to verify any updated information.
6. Classify these 15 algorithms into three parts (just like the modules in the structured programming) and generate a data flow diagram for each part, with emphasis on the control of those data which will be used more than one algorithm.

6/10-6/11 7. Examine the discrepancies between algorithms and revise the diagrams.

Future Plan:

1. Discuss and revise the diagrams with Team Members and SDST.
2. Continue the diagram design for ocean and land data processing.
3. Discuss the possibility of parallel processing.

Table 1. Algorithms and Input/Output Data Used in the MODIS Atmospheric Data Processing (I)

Algorithms with ID		Input and/or Output Data	
513	Water Vapor	1017	Aerosol Mass Loading
514	Cloud Joint Prob. Density Function	1022	Aerosol Size-distribution (Radius-Dispersion)
523	Total Ozone	1332	O3 Total Burden
524	Aerosol Optical Depth	1333	O3 Total Burden
525	Aerosol Size Distribution	1334	O3 Total Burden
526	Aerosol Mass Loading	1528	Cloud Pressure, TOP
527	Aerosol Single Scattering Albedo	1529	Cloud Pressure, TOP
528	Atmospheric Stability	1559	Stability (Lifted Index), Atmospheric
530	Total Precipitable Water	1560	Stability (Lifted Index), Atmospheric
531	Cloud Fractional Area	1588	Temperature Profile
532	Cloud Area Perimeter	1764	Cloud Drop Phase
533	Cloud Effective Emissivity	1765	Cloud Drop Phase
534	Cloud-Top Pressure and Temperature	1780	Cloud Drop Size (Effective Radius)
535	Cloud Water Thermodynamic Phase	1781	Cloud Drop Size (Effective Radius)
536	Cloud Droplet Effective Radius	1828	Humidity Profile
		1874	Precipitable Water
		1875	Precipitable Water
		2001	Albedo, Planetary Spectral, TOA
		2003	Albedo, Aerosol
		2015	Albedo, Land_sfc
		2016	Albedo, Land_sfc
		2068	Cloud Field Area
		2081	Cloud Cover
		2082	Cloud Cover
		2092	Cloud Field Perimeter
		2094	Cloud JPDF
		2116	Cloud Emissivity
		2126	Cloud Emissivity
		2127	Cloud Emissivity
		2282	Cloud Masking-shadowing
		2283	Cloud Masking-shadowing
		2284	Cloud Masking-shadowing
		2293	Aerosol Optical Depth, Spectral
		2294	Aerosol Optical Depth, Spectral
		2311	Cloud Optical Depth
		2312	Cloud Optical Depth
		2335	Aerosol Phase Function, Asymmetric
		2339	Level-1B Radiance, MODIS-N<3um
		2340	Level-1B Radiance, MODIS-N>3um
		2466	Cloud Temperature, TOP
		2467	Cloud Temperature, TOP
		2481	Lnad_sfc Temperature, Skin
		2523	Sea_sfc Temperature (SST)
		2750	Vegetation Index
		3321	Precipitable Water
		3322	Precipitable Water

Table 1. Algorithms and Input/Output Data Used in the MODIS Atmospheric Data Processing (II)

Ancillary Data

44 model output/analysis
46 temperature profile; in situ (radiosonde)
75 land surface temperature
121 cloud optical thickness; in situ (aircraft)
122 cloud liquid/ice content; in situ (aircraft)
185 aerosol radiation; in situ
744 humidity profiles; in situ (radiosonde)
745 column water vapor; in situ (radiosonde)

Table 1. Algorithms and Input/Output Data Used in the MODIS Atmospheric Data Processing (III)

Alog. ID	513	514	523	524	525	526	527	528	530	531	532	533	534	535	536
Input Prod. No. (from Alog. ID)															
1332												X			
1334 (523)				X											
1529 (534)		X										X			
1588	X							X	X			X	X		
1764 (535)															X
1765 (535)															X
1781 (536)		X													
1828						X		X	X			X	X		
1874 (513)				X											
2001							X								
2003 (527)				X											
2015															X
2016															X
2116		X													
2126 (533)													???		
2282	X											X			
2283	X											X			
2284	X											X			
2293 (524)					X	X									
2312 (536)		X													
2335				X			X								
2339	X	X	X	X	X	X	X		X	X	X	X	X	X	X
2340			X	X	X	X	X		X	X	X		X	X	X
2466 (534)		X													
2481	X														
2523	X														
2750				X											
Ancillary Data															
44	X		X			X		X	X			X	X		
46												X			
75	X							X	X	X					
121															X
122												X			
185				X	X	X	X								
744												X			
745												X			
Data Prod.	1874 3321 3322	2094	1333 1334	2293 2294	1022	1017	2003	1559 1560	1875 3322	2081 2082	2068 2092	2126 2127 (?)	1528 1529 2466 2467	1764 1765	1780 1781 2311 2312

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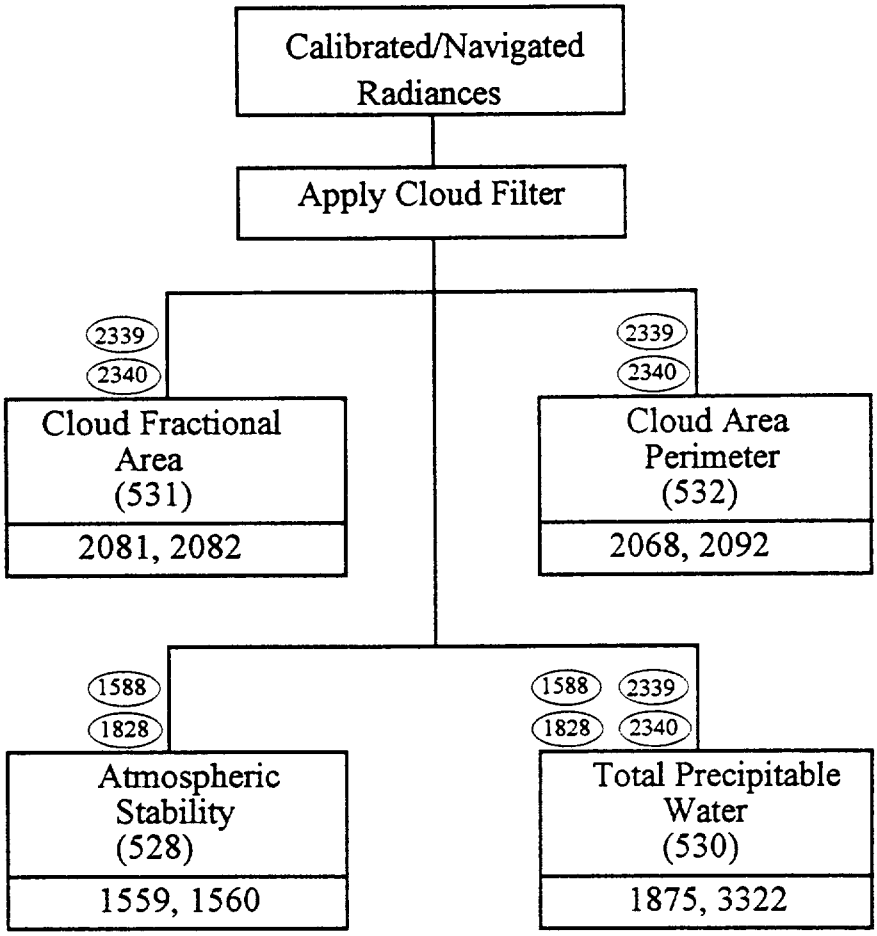
A Conceptual Overview of the Core MODIS Atmospheric Data Processing (Part I)



Product Number (examples):

2339: Level-1B Rad., MODIS-N<3um
2340: Level-1B Rad., MODIS-N>3um
1588: Temperature Profile
1828: Humidity Profile

Legend:

Algorithm (ID)
Data Products

Data from a "common" block

Data from an algorithm

** This diagram only emphasizes the data which will be used by more than one algorithm.

** In order to reduce the redundancy of data input, a "common" block will be used to store the huge volume data which will be processed by more than one algorithm.

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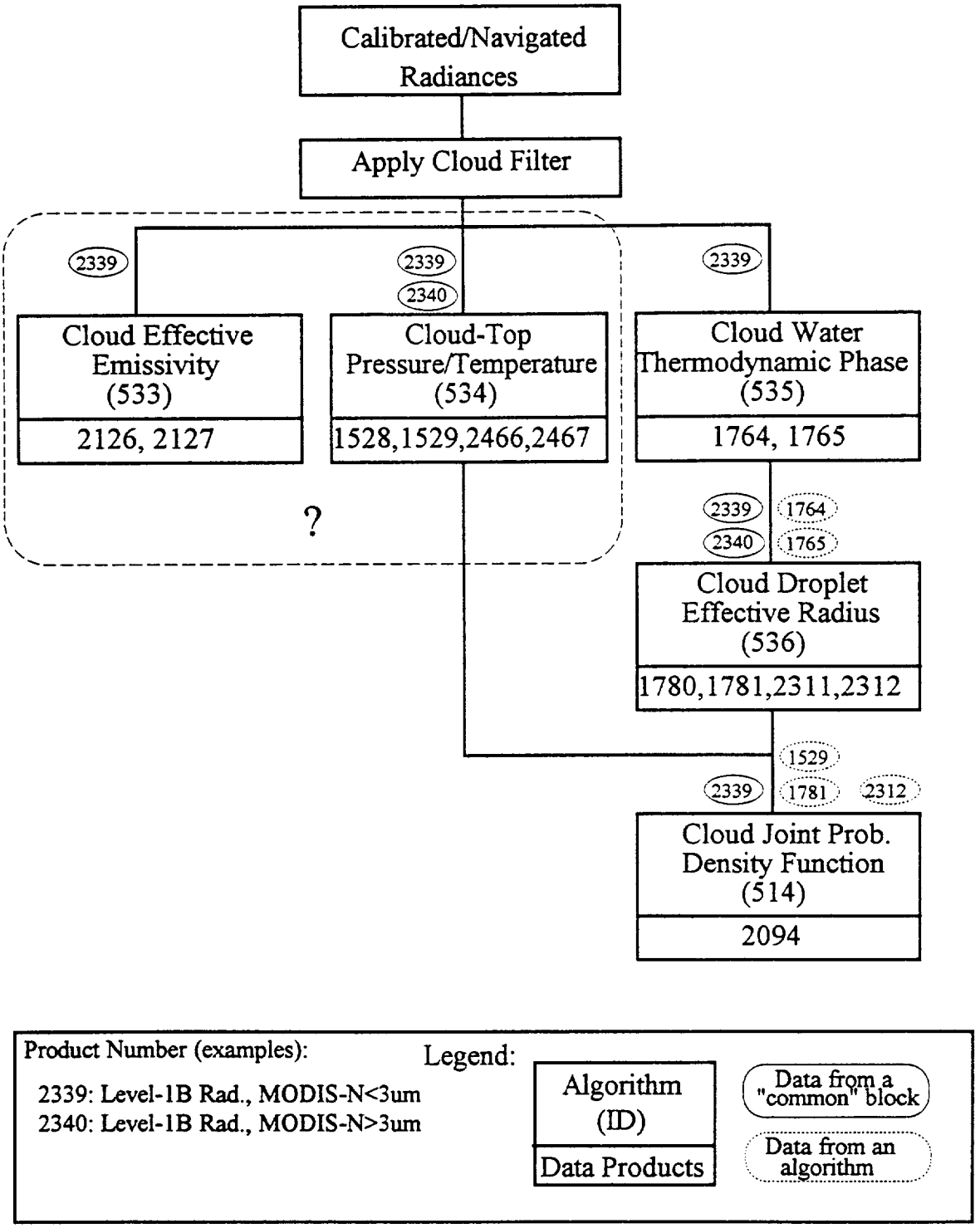
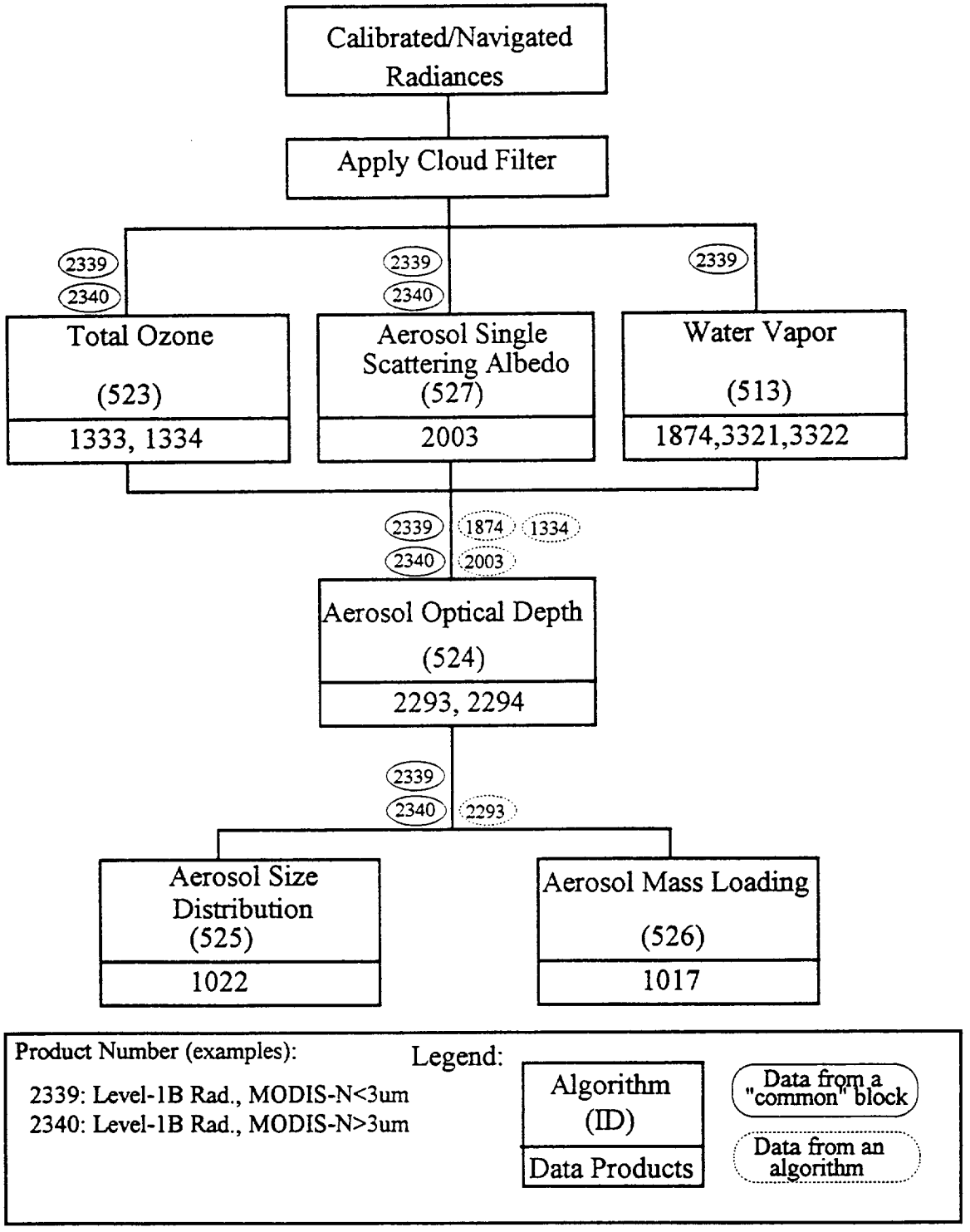
A Conceptual Overview of the Core MODIS Atmospheric Data Processing (Part II)



** This diagram only emphasizes the data which will be used by more than one algorithm.

** In order to reduce the redundancy of data input, a "common" block will be used to store the huge volume data which will be processed by more than one algorithm.

A Conceptual Overview of the Core MODIS Atmospheric Data Processing (Part III)



** This diagram only emphasizes the data which will be used by more than one algorithm.

** In order to reduce the redundancy of data input, a "common" block will be used to store the huge volume data which will be processed by more than one algorithm.

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MODIS

Software and Data Management Plan

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1 Introduction

1.1 Purpose

The purpose of this MODIS Software and Data Management Plan is to address the policy of the MODIS Science Team for management of the MODIS science data and the software which will be developed for the purpose of processing these data and generating data products on an operational basis. This software and data management policy will be coordinated with the Earth Observing System (EOS) Project to assure consistency with the requirements of the EOS Data and Information System (EOSDIS).

1.2 Scope

This MODIS Software and Data Management Plan defines the nature of the software to be developed for processing MODIS science data, and it outlines the procedures to be followed in software development, porting, integration, testing, validation, maintenance, modification, and documentation. Provision is made for a Configuration Management (CM) system to protect the MODIS operational software and data products.

The plan provides for the calibration, validation, earth location, processing, archival and distribution to the science users, within the EOSDIS data management structure. The end-to-end data flow from its origin at the MODIS instrument to the science product archival and distribution is described in the EOSDIS context.

The collection and management of input data, ancillary data and data from external sources is described as they relate to the processing and production of MODIS products. The manner in which reference data for ground control points, digital elevation and terrain models, atmospheric models, coastline definitions, etc. will be collected and integrated into the system is specified.

The Plan describes the output products to be produced, including standard, quicklook, browse, and special products. The descriptions include the volume, product level, and format of the output data. Formats will comply with Investigator Working Group (IWG) approved standards.

The software development and validation schedule is contained in Appendix B. The schedule is based upon three software deliveries prior to launch. Each delivery of software to the EOSDIS Core System (ECS) will include software, input test data and test results, user's guide, operations guide, and software version description. Conformance to the schedule is contingent upon timely provision of resources, support, and information from the EOS Project.

Consideration is given to processing and management of quick look data for field experiments, targets of opportunity and special investigations. A plan is provided for the generation and delivery of metadata and browse products.

The responsibilities of all elements of the MODIS Team are identified in terms of data product requirements, operational scenarios, algorithm integration and testing, design and implementation of the operational processing system, data product validation, integration of computer resources, and development of documentation during the definition, prelaunch and postlaunch phases.

2 MODIS End-to-End Data Flow

MODIS is part of the Earth Observing System (EOS) which consists of the space segment, the ground segment, and the science user segment. (The following sections on the Space Segment and the Ground Segment do not apply to the EOS Color instrument.

2.1 Space Segment

Two series of MODIS instruments are planned, a morning (AM) series and an afternoon (PM) series. There will be three launches with a MODIS instrument in each series covering three consecutive five-year intervals of operation. Thus, there will be a total of fifteen years of data from each of the series of instruments (AM and PM). The first launch is planned for mid 1998.

The Space Network (SN)/Tracking and Data Relay Satellite System (TDRSS) will be the primary system for relaying data from the instrument to the ground.

2.2 Ground Segment

MODIS data will be downlinked during TDRSS contact periods. The Earth Data and Operations System (EDOS) will perform Level-0 processing on the science, housekeeping, and ancillary data and will provide the data to the Goddard Distributed Active Archive Center (DAAC).

2.3 Science User Segment

The MODIS Science Team is responsible for the science algorithms for generating all science data products, the quality and validity of the results, and the scientific analysis and publication of scientific results.

2.4 Data Acquisition

2.4.1 EOS Data

MODIS instrument data and platform ancillary data will be acquired as stated in the Ground Segment section above. Data from other EOS instruments will also be available directly from the ECS.

2.4.2 Correlative Data

Correlative data which are required by a number of investigators is to be acquired and integrated into the EOSDIS by the EOS Project in a cooperative effort with the Science Team Members. This includes reference data such as ground control point data, digital elevation and terrain models, atmospheric models, coastline definitions, etc.

Each Team Member is responsible for arranging the agreement for providing all other non EOS data that are needed to validate MODIS Science Data products. If the data will be supplied on a continuing basis, the SDST will implement and administer the process. The EOS Project is responsible for reformatting the data as needed for the DADS. The SDST will work with the Project to get publicly available correlative data. The TM is responsible for submitting to the DADS any needed research data which is not generally available. Neither the SDST nor the TMs will reformat correlative data to IWG standards.

3 MODIS Science Software

The MODIS Science Team Leader and Team Members are responsible for the requirements analysis, design, implementation, test plan, test data, all levels of testing, and lifetime evolution, maintenance and updating of the MODIS Science Software. The source code and documentation for every version of every science algorithm will be provided to the Data Archive and Distribution System (DADS), but neither the Team Members nor the SDST will provide support to other users of the software.

3.1 Processes and Procedures

3.1.1 Product Generation System (PGS) Toolkit

The EOS Project intends to provide a PGS Toolkit which will serve to isolate the science software from hardware, system, and language interface library dependencies. The Toolkit will be implemented at the Science Computing Facilities (SCFs) as well as at the PGS. Science software will be developed using the Toolkit as a standard library of callable functions and subroutines including input/output, math and statistics support. Updating and modification of software will be much more straightforward in those cases where the PGS Toolkit is fully utilized. The ability of the SDST and TMs to use the toolkit and deliver software on schedule depends upon timely availability of the PGS Toolkit.

3.1.2 Coding Languages

All MODIS science software will be programmed in standard versions of C, Fortran, UNIX, etc. (including C++ and Fortran 90) as specified by the EOSDIS. Support for object oriented and parallel processing software is a requirement.

3.1.3 Digital Elevation Model

MODIS will require a Digital Elevation Model (DEM) for use in processing the science data. MODIS assumes that the EOS Project will provide a standard DEM and a set of calling sequences to be used with the DEM.

3.2 Level-1 Software

The MODIS Science Team Leader has assigned responsibility to the MODIS Science Data Support Team (SDST) for all aspects of the development of the MODIS Level-1A and Level-1B software, except for the MODIS science data calibration, which has been specifically assigned to the MODIS Characterization Support Team (MCST). The SDST schedule for development of MODIS Level-1A and -1B algorithms is given in Appendix B. The schedule is based upon three initial software versions prior to launch. The purpose of the three versions is to:

- ß Test migration from the SCF to the EOSDIS, exercise interfaces, and test execution in operational environment.
- V1 Correct any problems in the ß Version, complete operator interface, generate all messages.
- V2 Software ready for launch. Final integration, test of operations procedures, training of operations staff.

3.2.1 Level-1 Requirements

The SDST is responsible to the MODIS Team Leader for developing the Level-1 requirements which form the basis for the Level-1 software design. There will be a requirements review involving representatives from the MODIS Science Team, the MODIS Characterization Support Team (MCST), and the EOS Project. The software requirements, design, and code will be developed as an iterative process involving the TMs. There will be substantial changes in going from ß to V2.

3.2.2 Level-1 Design

The SDST is responsible for developing the MODIS Level-1A and -1B designs. Computer Aided Software Engineering (CASE) tools, such as Cadre Technologies Teamwork, will be used in the design process. These tools will also be on-line and accessible by the TMs for their use. Each preliminary design will be followed by a Preliminary Design Review (PDR). The design will then be refined and improved. Approval of the final design comes at the Critical Design Review (CDR). The design reviews will involve representatives from the MODIS Science Team, the MODIS Characterization Support Team (MCST), and the EOS Project.

3.2.3 Code Development

The code for implementing the Level-1A and -1B designs will be produced by the SDST.

3.2.4 Test Plan & Test Data Development

The SDST will develop a Level-1 Test Plan and test data sets which will exercise all of the viable branches (within reason) in the code, checking for proper results. The tests will also check for proper functioning of the software in the presence of anomalous or meaningless data.

3.2.5 Test and Delivery to ECS

After the software has been thoroughly tested on the TLCF, the SDST is responsible for porting the software to the EOSDIS Product Generation Service (PGS) and participating in the test process in the PGS.

3.2.6 Calibration

The MODIS Characterization Support Team (MCST) is responsible to the MODIS Science Team Leader for the development of the MODIS calibration algorithms and the implementing code. The calibration code will be delivered to the SDST for optimization and integration into the MODIS Level-1B software. The delivery will contain:

- source code, installation instructions and "make" file
- operating instructions, and other documentation,
- test input and output data sets which test all paths in the code
- test drivers which run the code with the input test data, compare the results with the corresponding output data sets, and flag any inconsistencies.

3.2.7 Earth Location

The Earth-surface locations of MODIS pixels will be computed based upon the position and attitude of the spacecraft, the location and orientation of the MODIS instrument on the spacecraft, the pointing angles, any available corrections to these parameters, and the surface height as provided from a model (spherical, ellipsoidal, geoidal, or digital elevation). Earth location information will be included in the Level-1B product.

3.3 Level-2, 3 and 4 Software

The MODIS Science Team Leader and Team Members are responsible for the development of their own MODIS Level-2, 3, and 4 algorithms. (To avoid awkward terminology, in the following discussion the term "Level-2" is used to cover Levels-3 and 4 as well.) A list of all of the MODIS Science Data Products is given in Appendix C together with the names of the responsible Team Members.

The SDST is jointly responsible with the Team Members for integrating their code into the Level-2 Processing Shell and porting it to the PGS. The Team Members are responsible for the correct operation of their code on the PGS. Team Members will provide three versions of the code, ß, V1, and V2, for the Level-2 algorithms before launch. Final responsibility for delivering code which can operate correctly in the ECS environment rests with the TM.

MODIS Science Team Members are responsible for the accuracy of the data products generated by their algorithms. Achievement must be a collaborative effort involving the TMs, the SDST and the Project.

3.3.1 Coding Recommendations

The SDST will generate a document of coding recommendations for MODIS Science Team Members. The recommendations will be designed to facilitate porting, integration, testing, operation and updating of the Team Members code on the EOSDIS. The coding recommendations will be revised as the process becomes more mature. Portability limitations must be minimized, but it is recognized that in some cases strict portability can be achieved only with a severe sacrifice of efficiency.

3.3.2 Level-2 Processing Shell

The SDST is responsible for the design, development and testing of the MODIS Level-2 Processing Shell which will be used to integrate the code provided by Team Members into an operational system on the EOSDIS. The Level-2 Processing Shell will be provided in three versions, ß, V1 and V2, with V2 being the operational version at launch. Iteration with the TMs will be emphasized during the Shell development.

3.3.3 Review of Team Member Algorithms

The MODIS Science Team will establish a process for science review of Team Member algorithms. Progress review for the EOS Project will be on an annual basis. The SDST and Team Members will conduct iterative reviews of algorithm status.

3.3.4 TM Code Development

MODIS Team Members are responsible for developing the code for their own algorithms. The &, V1 and V2 versions will be completed and delivered according to the schedule in Appendix B, to provide time for integration, testing and delivery to the EOSDIS. Early availability of the coding recommendations and the PGS toolkit are essential prerequisites to meeting the software development schedule.

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Miami will provide a section here on Oceans algorithms.

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3.3.5 Integration of Team Member Code

Each Team Member is responsible, with the assistance of the SDST, for porting his code to the PGS and integrating the code into the Level-2 Processing Shell. This will be an iterative process wherein the TM delivers the latest version of the:

- source code, installation instructions and "make" file
- operating instructions, and other documentation,
- test input and output data sets which test all paths in the code
- test drivers which run the code with the input test data, compare the results with the corresponding output data sets, and flag any inconsistencies.

The SDST will port the software to the PGS and run the test cases. It is anticipated that the SDST will have to modify the code to account for differences in environment between the development machine and the PGS. Only necessary changes will be made. If serious problems are encountered in porting the code or in the test results, these will be resolved by the SDST and the TM working together.

After the TM code has been successfully ported to the PGS, the SDST will integrate the ported code into the Level-2 processing shell. The integration will not change the scientific processes except to port the code, optimize, and integrate. Again, it will be necessary for the SDST and the TM to work together to resolve any serious problems which arise in the integration process.

3.3.6 Test and Delivery

After the integration is completed, the SDST will deliver the software to the EOSDIS for testing in the operational environment.

3.3.7 End-to-End Test

Before launch, the SDST will work with the TMs to perform an end-to-end test using simulated data to check out the complete system from receipt of Level-0 data through Level-1A and Level-1B processing, including calibration, and the generation of all standard Level-2 before-launch products.

3.3.8 Post Launch Activities

There will be many updates and refinements of all levels of algorithms after launch. In the post-launch era, the SDST will continue the previous support in addition to supporting algorithm updating, refinement or replacement, the generation of special products, and quality assurance of products. The Level-1A algorithm will require adjustment to accommodate any unforseen anomalies in the Level-0 data. The calibration algorithms and coefficients are expected to change as soon as sufficient real MODIS data are available for evaluation and comparison of various calibration alternatives. The calibration modules in the Level-1B processing code will require modification. Refinements are expected in many of the higher level algorithms as various manifestations are detected in the data. A period of intense software activity is expected, involving interaction among all members of the MODIS team.

3.4 Utilities

The SDST will develop utility software for generating MetaData, Browse data, for Earth location/matching to in situ data, for data conversion, resampling, subsampling, etc.

3.5 Configuration Management

The operational software is under EOSDIS configuration management control to assure the identification of data products with the associated processing software versions, and to assure that modified software is adequately tested before being implemented. The SDST provides the documentation to the PGS to support configuration management.

Configuration management is not intended to inhibit the use of development versions of the code to test algorithm variations and new techniques. As new software is proven and tested, it will be incorporated into the operational version through the approved configuration management process.

During the first 18 months after launch, it will be necessary to operate at a reduced level of configuration management control of algorithm updates in order to permit TMs to respond to new information and preliminary results, and to refine and improve their algorithms in a timely manner. During this interim period, TMs will have CM control of their algorithms, making changes as often as required, with the condition that no changes will be permitted which will overwhelm the system. During this 18-month period after launch, the CM system will keep records of versions of software used to generate the products, with the TMs retaining control over which version is to be used for production. Decisions to reprocess all data using a new software version must be coordinated with the Project, giving consideration to the availability of resources.

3.6 Reprocessing

The procedure for initiating reprocessing is TBD.

4 MODIS Data Processing

4.1 Data Product Descriptions

The MODIS Science Data Products are tabulated in Appendix C along with the responsible Team Members.

4.2 Data Calibration

The MCST is responsible to the MODIS Science Team Leader and Team Members for the MODIS science data calibration on a continuing basis throughout the experiment. Modifications to the calibration algorithms and/or coefficients will be incorporated into the operational system by the SDST.

4.3 Quality Control (QC)

The SDST will work with the Team Members and the MCST on QC which can be automated, to the extent that the TM specifies. The SDST will implement the generation of QC messages, review messages in a timely manor, and notify the TM of problems. The SDST will act on QC messages indicating coding problems in the Level-1 software or the Level-2 Processing Shell. Team Members are responsible for QC messages with science implications.

4.4 Data Validation

The MODIS Science Team Members and the MCST are responsible for validation of their data products commensurate with available resources. The SDST supports implementation of the TM approach and provides validation products.

4.5 Data Formats

Data formats will be specified by EOS policy. All MODIS science data products will be output in the specified format.

4.6 Quick-Look Data

TBD

4.7 Browse Data

TBD

4.8 Special Products

TBD

5 MODIS Data Storage and Archiving

MODIS data storage and archiving are the responsibility of the DAACs.

6 MODIS Data Access and Distribution

MODIS data access and distribution are the responsibility of the DAACs.

7 MODIS Data Discard Policy

Policy governing discarding of EOS data is TBD. The SDST assumes that Level-0 MODIS data will be maintained for the life of the MODIS project.

8 Post Launch Products

The development of post-launch products will follow the same guidelines as those for at-launch products.

Appendix A: Glossary TBS

ALGORITHM INTEGRATION

ANCILLARY DATA

ß VERSION SOFTWARE

BROWSE DATA

COMPUTER AIDED SOFTWARE ENGINEERING (CASE) TOOLS

CONFIGURATION MANAGEMENT

CORRELATIVE DATA

CRITICAL DESIGN REVIEW (PDR)

DATA PRODUCTS

DIGITAL ELEVATION MODEL

DIGITAL TERRAIN MODEL

EARTH LOCATION

INPUT DATA

LEVEL-0 DATA

LEVEL-1A DATA PRODUCTS

LEVEL-1B DATA PRODUCTS

LEVEL-2 DATA PRODUCTS

LEVEL-3 DATA PRODUCTS

LEVEL-4 DATA PRODUCTS

MODIS CHARACTERIZATION SUPPORT TEAM (MCST)

METADATA

POST-LAUNCH PRODUCTS

PRELIMINARY DESIGN REVIEW (PDR)

QUICK-LOOK DATA

SCIENCE DATA SUPPORT TEAM (SDST)

SOFTWARE INTEGRATION

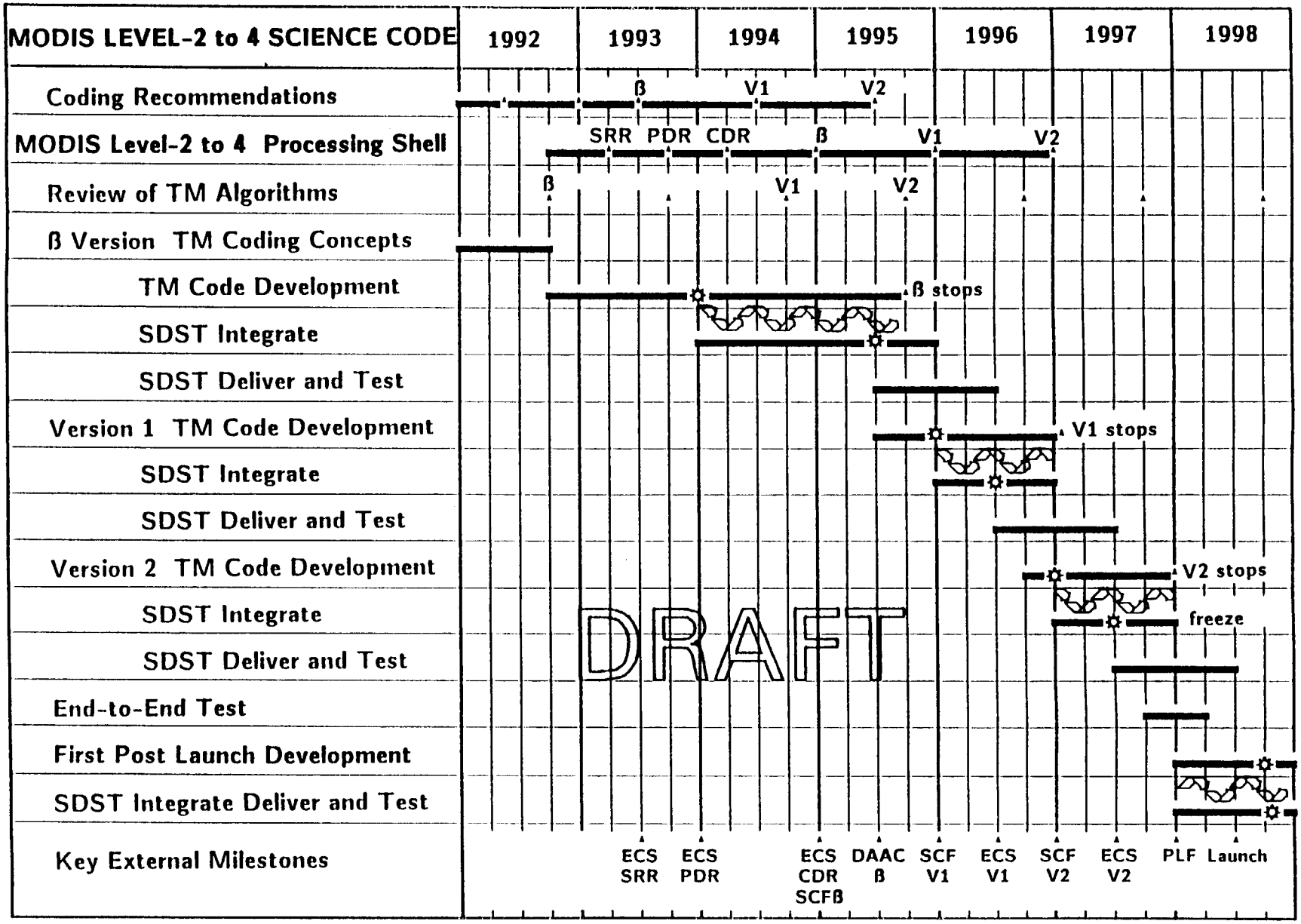
SOFTWARE PORTING

SPECIAL PRODUCTS

TEAM LEADER COMPUTING FACILITY (TLCF)

VERSION 1 SOFTWARE

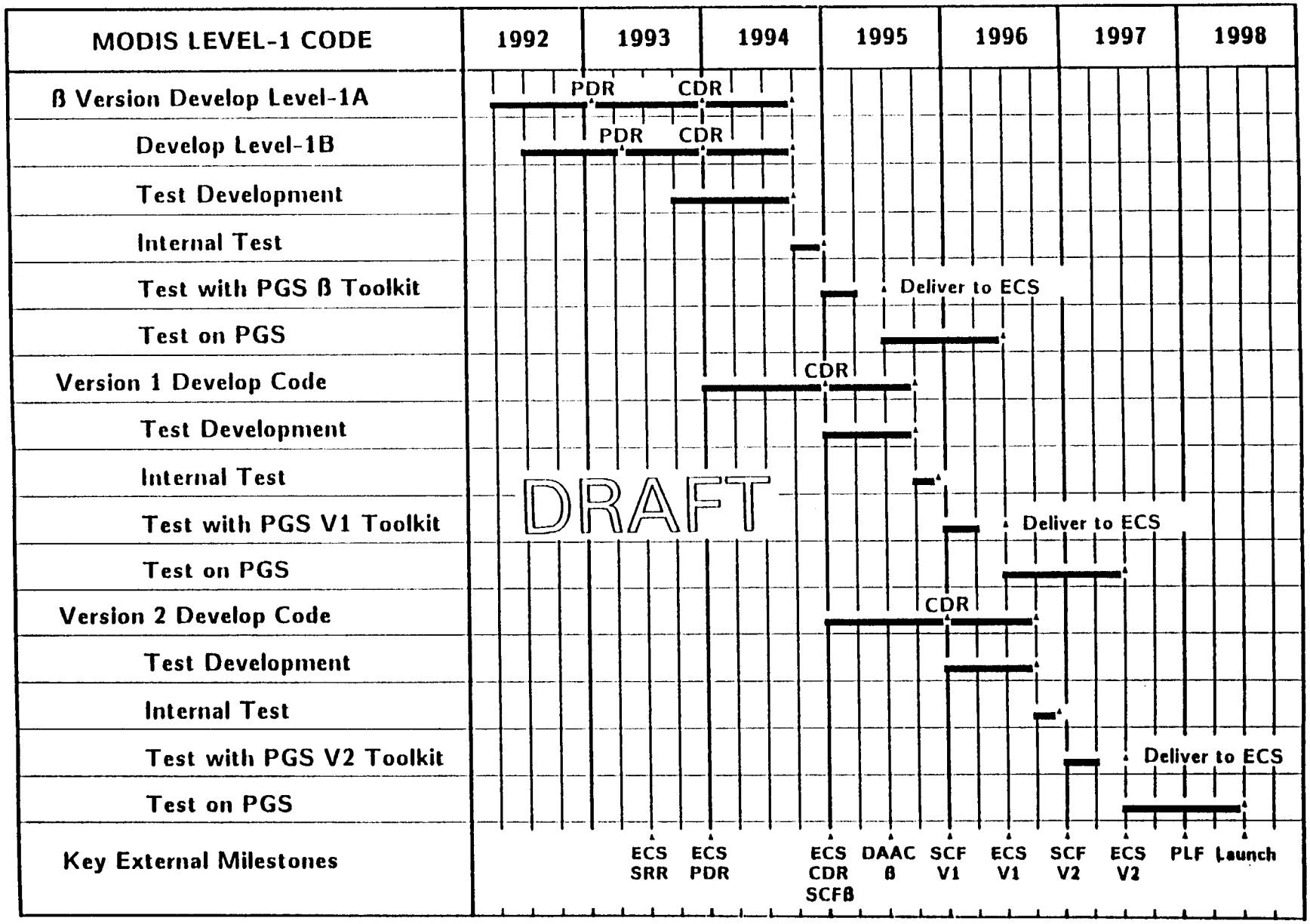
VERSION 2 SOFTWARE



MODIS SDST, June 11, 1992

MODIS\PLANS\GHANT.08E

✡ Initial Delivery


MODIS LEVEL-1 CODE
1992
1993
1994
1995
1996
1997
1998
ß Version Develop Level-1A
PDR
CDR
Develop Level-1B
PDR
CDR
Test Development
Internal Test
Test with PGS ß Toolkit
Deliver to ECS
Test on PGS
Version 1 Develop Code
CDR
Test Development
Internal Test
Test with PGS V1 Toolkit
Deliver to ECS
Test on PGS
Version 2 Develop Code
CDR
Test Development
Internal Test
Test with PGS V2 Toolkit
Deliver to ECS
Test on PGS
Key External Milestones
ECS SRR
ECS PDR
ECS CDR SCFß
DAAC ß
SCF V1
ECS V1
SCF V2
ECS V2
PLF
Launch
DRAFT

Appendix C: MODIS Science Data Products

The following pages contain the MODIS Data Products List.

MODIS Products by Discipline (Land)

Prod #	Revised Product Name	Investigator	Instrument	Platform	DAAC	Time frame	Units	Accuracy Abs :: Rel	Temporal Resolution	Horizontal Resol. :: Domain	Vertical Resol. :: Domain
2110	Land_sfc Emissivity	Barton	MODIS *	AM,PM	EDC	PL	dimensionless	0.01 :: 0.01	1/day, 1/wk	1 km :: G,R	N/A :: Sfc
2111	Land_sfc Emissivity	Barton	MODIS *	AM,PM	EDC	PL	dimensionless	0.01 :: 0.01	1/day, 1/wk	50 km :: G,R	N/A :: Sfc
2537	Land_sfc Temperature-Difference, Day-Night	Huete	MODIS	AM,PM	GSFC	PL	K	1 K :: 1 K	1/day	856 m :: R	N/A :: Sfc
2047	Soil Brightness Index	Huete	MODIS *	AM,PM	EDC	AL	%	5% :: 5%	1/mo	1 km :: Land/R	N/A :: Sfc
2095	Soil Color Index	Huete	MODIS *	AM,PM	EDC	AL	class	10% :: 5%	1/mo	1 km :: Land/R	N/A :: Sfc
2724	*Vegetation Index, Soil&BRDF_Adjusted*	Huete	MODIS *	AM,PM	EDC	PL	dimensionless	0.01 :: 0.01	1/day, 1/wk, 1/mo	1 km :: Land/R	N/A :: Sfc
2748	*Vegetation Index, Soil_Adjusted*	Huete	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.01	1/day, 1/wk, 1/mo	1 km :: Land/R	N/A :: Sfc
2659	Vegetation Growing_Season Duration	Justice	MODIS *	AM,PM	EDC	PL	day	10 dy ::	1/yr	1 km :: Land	N/A :: Sfc
2660	Vegetation Growing_Season Duration	Justice	MODIS *	AM,PM	EDC	PL	day	10 dy ::	1/yr	10 km :: Land	N/A :: Sfc
2749	*Vegetation Index*	Justice, Huete et al	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.01	1/day, 1/wk, 1/mo	10 km :: Land	N/A :: Sfc
2750	*Vegetation Index*	Justice, Huete et al	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.01	1/day, 1/wk, 1/mo	0.5 km :: Land/R	N/A :: Sfc
2751	*Vegetation Index*	Justice, Huete et al	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.01	1/day, 1/wk, 1/mo	1 km :: Land/R	N/A :: Sfc
2429	Land_sfc Reflectance, Directional	Kaufman et al	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.005	1/day	1 km :: G	N/A :: Sfc
2430	Land_sfc Reflectance, Directional	Kaufman et al	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.005	1/day	0.5 km :: G	N/A :: Sfc
2431	Land_sfc Reflectance, Directional	Kaufman et al	MODIS *	AM,PM	EDC	AL	dimensionless	0.01 :: 0.005	1/day	0.25 km :: G	N/A :: Sfc
2711	Fire Class	Kaufman, Justice	MODIS	AM,PM	EDC	AL	C	10 C :: 5 C	1/day, 1/wk	10 km :: Land	N/A :: Sfc
2663	*Fire Count*	Kaufman, Justice	MODIS	AM,PM	EDC	AL			1/day, 1/wk	1 km :: Land/R	N/A :: Sfc
2664	*Fire Count*	Kaufman, Justice	MODIS	AM,PM	EDC	AL			1/day, 1/wk	10 km :: Land	N/A :: Sfc
2665	*Fire Extent*	Kaufman, Justice	MODIS	AM,PM	EDC	AL			1/day, 1/wk	1 km :: Land/R	N/A :: Sfc
2666	*Fire Extent*	Kaufman, Justice	MODIS	AM,PM	EDC	AL			1/day, 1/wk	1 dg :: Land	N/A :: Sfc
2471	*Fire Temperature*	Kaufman, Justice	MODIS	AM,PM	EDC	AL	C	10 C :: 5 C	1/day, 1/wk	1 km :: Land/R	N/A :: Sfc
2379	Level-2 Radiance, Land_leaving	Kaufman, Tanre	MODIS *	AM,PM	GSFC	AL	W/m^2/sr/um	10% :: 5%	1/day	1 km :: Land/R	N/A :: Sfc
2380	Level-2 Radiance, Land_leaving	Kaufman, Tanre	MODIS *	AM,PM	GSFC	AL	W/m^2/sr/um	10% :: 5%	1/day, 1/mo	10 km :: Land	N/A :: Sfc
2381	Level-2 Radiance, Land_leaving	Kaufman, Tanre	MODIS *	AM,PM	GSFC	AL	W/m^2/sr/um	10% :: 5%	1/day	0.5 km :: Land/R	N/A :: Sfc
2404	Land_sfc Radiance-Correction, Topographic	Muller	MODIS *	AM,PM	EDC	AL			1/day	1 km :: Land/R	N/A :: Sfc
2405	Land_sfc Radiance-Correction, Topographic	Muller	MODIS *	AM,PM	EDC	AL			1/day	10 km :: Land	N/A :: Sfc
2434	Land_sfc Reflectance, Directional	Muller, Strahler	MODIS *	AM,PM	EDC	AL	fraction	10% :: 5%	1/day	1.1 km :: R	N/A :: Sfc
2680	*Vegetation Index, Leaf Area, (LAI)*	Running	MODIS *	AM,PM	EDC	PL	dimensionless	0.1-0.25 :: 5-20%	1/day, 1/wk	pixel_size :: Land/G,R,L	N/A :: N/A
2703	*Vegetation Productivity, Primary*	Running	MODIS *	AM,PM	EDC	PL	Mg/km^2/yr	100 :: 5-30%	1/wk, 1/mo, 1/yr	1 km :: Land/G,R	N/A :: N/A
2723	Vegetation Stress	Running, Huete	MODIS *	AM,PM	EDC	PL	s/m	200-1000 :: 5-30%	1/day, 1/wk	pixel_size :: Land/G,R,L	N/A :: N/A
3020	Snow Cover	Salomonson	MODIS *	AM,PM	NSIDC	AL	km^2	<=5% :: <=5%	1/day, 1/wk	10 km :: Land	N/A :: Sfc
3021	Snow Cover	Salomonson	MODIS *	AM,PM	NSIDC	AL	km^2	<=5% :: <=5%	1/day, 1/wk	1 km :: Land/R	N/A :: Sfc
2669	*Land_Cover Type*	Strahler, Huete et al	MODIS *	AM,PM	EDC	AL	categorical fraction	10% :: 5%	1/mo, 1/seas	1 km :: Land	N/A :: Sfc
2670	*Land_Cover Type*	Strahler, Huete et al	MODIS *	AM,PM	EDC	AL	categorical fraction	10% :: 5%	1/mo, 1/seas	5 km :: Land	N/A :: Sfc
2671	*Land_Cover Type-Change*	Strahler, Huete et al	MODIS *	AM,PM	EDC	AL	categorical fraction	10% :: 7%	1/seas	1 km :: Land	N/A :: Sfc
2672	*Land_Cover Type-Change*	Strahler, Huete et al	MODIS *	AM,PM	EDC	AL	categorical fraction	10% :: 7%	1/seas	5 km :: Land	N/A :: Sfc
2015	Albedo, Land_sfc	Tanre, Muller	MODIS *	AM,PM	EDC	PL	dimensionless	15% :: 5 - 8%	1/day, 1/wk	1 km :: G,R	N/A :: Sfc
2016	Albedo, Land_sfc	Tanre, Muller	MODIS *	AM,PM	EDC	PL	dimensionless	15% :: 5 - 8%	1/day, 1/wk	10 km :: G,R	N/A :: Sfc
2424	Land_sfc Reflectance, Bi-directional, (BRDF)	Tanre, Muller	MODIS *	AM,PM	EDC	PL	%	15% :: 5 - 8%	1/day, 1/wk	1 km :: G,R	N/A :: Sfc
2425	Land_sfc Reflectance, Bi-directional, (BRDF)	Tanre, Muller	MODIS *	AM,PM	EDC	PL	%	15% :: 5 - 8%	1/day, 1/wk	10 km :: G,R	N/A :: Sfc
2337	*Vegetation Index, Polarization*	Vanderbilt	MODIS *	AM,PM	EDC	PL	dimensionless		1/day	pixel_size :: Land	N/A :: Sfc
3323	Land_sfc Emissivity	Wan	MODIS	AM,PM	EDC	PL	dimensionless	0.05 :: 0.02	1 dy, 1 wk	1 km :: Land/R	N/A :: Sfc
3324	Land_sfc Emissivity	Wan	MODIS	AM,PM	EDC	PL	dimensionless	0.05 :: 0.02	1 dy, 1 wk	10 km :: Land	N/A :: Sfc
2484	*Land_sfc Temperature*	Wan	MODIS	AM,PM	EDC	AL	C	1 C :: 1 C	1/day, 1/wk	1 km :: Land/R	N/A :: Sfc
2485	Land_sfc Temperature	Wan	MODIS	AM,PM	EDC	AL	C	1-3 C :: 1 C	1/day, 1/wk	10 km :: Land	N/A :: Sfc

MODIS Prod... by Discipline (Ocean)

Prod #	Revised Product Name	Investigator	Instrument	Platform	DAAC	Time frame	Units	Accuracy Abs :: Rel	Temporal Resolution	Horizontal Resol. :: Domain	Vertical Resol. :: Domain
3211	*Chlorophyll Fluorescence Efficiency*	Abbott	MODIS *	AM,PM	GSFC	PL	dimensionless	15% :: 5%	1/day, 1/wk	1 km :: Ocean/R	N/A :: TOO
3212	*Chlorophyll Fluorescence Efficiency*	Abbott	MODIS *	AM,PM	GSFC	PL	dimensionless	15% :: 5%	1/day, 1/wk	20 km :: Ocean/R	N/A :: TOO
2575	*Chlorophyll Fluorescence Line Height*	Abbott	MODIS	AM,PM	GSFC	AL	mW/cm^2/sr/um	.004 :: .001	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R	N/A :: TOO
2576	Chlorophyll Fluorescence Line Height	Abbott	MODIS	AM,PM	GSFC	AL	mW/cm^2/sr/um	.004 :: .001	1/day, 1/wk, 1/mo	1 km :: Ocean/R,L	N/A :: TOO
2566	Chlorophyll_a Conc	Abbott	MODIS *	AM,PM	GSFC	PL	mg/m^3	50-100% :: 35%	1/day, 1/wk, 1/mo	1 km :: Ocean/G,R,L	N/A :: TOO
2567	Chlorophyll_a Conc	Abbott	MODIS *	AM,PM	GSFC	PL	mg/m^3	50-100% :: 35%	1/day, 1/wk, 1/mo	4 km :: Ocean/G,R,L	N/A :: TOO
2568	Chlorophyll_a Conc	Abbott	MODIS *	AM,PM	GSFC	PL	mg/m^3	50-100% :: 35%	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R,L	N/A :: TOO
2602	Ocean Productivity, Primary	Abbott	MODIS *	AM,PM	GSFC	PL	mg C/m^2/day	:: 50-100%	1/day, 1/wk, 1/yr	1 km :: Ocean-I	N/A :: TOO
2603	Ocean Productivity, Primary	Abbott	MODIS *	AM,PM	GSFC	PL	mg C/m^2/day	:: 50-100%	1/day, 1/wk, 1/yr	50 km :: Ocean-I	N/A :: TOO
2604	Ocean Productivity, Primary	Abbott	MODIS *	AM,PM	GSFC	PL	mg C/m^2/day		1/day, 1/wk	1 km :: Ocean/G,R,L	N/A :: Sfc
2605	Ocean Productivity, Primary	Abbott	MODIS *	AM,PM	GSFC	PL	mg C/m^2/day		1/day, 1/wk	20 km :: Ocean/G,R,L	N/A :: Sfc
2527	*Sea_sfc Temperature (SST)*	Brown	MODIS	AM,PM	GSFC	AL	K	0.2 K :: 0.1-0.2 K	1/day, 1/wk, 1/mo	1 km :: Ocean/L	N/A :: Sfc
2528	Sea_sfc Temperature (SST)	Brown	MODIS	AM,PM	GSFC	AL	K	0.3-0.6K :: 0.1-0.3K	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R	N/A :: Sfc
2529	Sea_sfc Temperature (SST)	Brown	MODIS	AM,PM	GSFC	AL	K	0.3-0.6K :: 0.1-0.3K	1/day, 1/wk, 1/mo	4 km :: Ocean/R,L	N/A :: Sfc
2530	Sea_sfc Temperature (SST)	Brown, Barton	MODIS	AM,PM	GSFC	AL	K	0.3-0.6K :: 0.1-0.3K	1/day, 1/wk, 1/mo	4 km :: Ocean/R,L	N/A :: Sfc
2531	Sea_sfc Temperature (SST)	Brown, Barton	MODIS	AM,PM	GSFC	AL	K	0.3-0.6K :: 0.1-0.3K	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R	N/A :: Sfc
2532	Sea_sfc Temperature (SST)	Brown, Barton	MODIS	AM,PM	GSFC	AL	K	0.3-0.4K :: 0.1-0.6K	1/day, 1/wk, 1/mo	50 km :: Ocean	N/A :: Sfc
2569	Chlorophyll_a Conc	Carder	MODIS *	AM,PM	GSFC	AL	mg/m^3	50% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean-II/ L	N/A :: TOO
2570	Chlorophyll_a Conc	Carder	MODIS *	AM,PM	GSFC	AL	mg/m^3	50% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean-II/G,R	N/A :: TOO
2580	Organic Matter Conc, Dissolved	Carder	MODIS *	AM,PM	GSFC	AL	mg/m^3	150% :: 30%	1/day, 1/wk, 1/mo	20 km :: Ocean	N/A :: TOO
2581	Organic Matter Conc, Dissolved	Carder	MODIS *	AM,PM	GSFC	AL	mg/m^3	150% :: 30%	1/day, 1/wk, 1/mo	1 km :: Ocean/R,L	N/A :: TOO
2571	*Chlorophyll_a Conc*	Clark	MODIS *	AM,PM	GSFC	AL	mg/m^3	30% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean-I/ L	N/A :: TOO
2572	*Chlorophyll_a Conc*	Clark	MODIS *	AM,PM	GSFC	AL	mg/m^3	30% :: 10%	1/day, 1/wk, 1/mo	20 km :: Ocean-I/G,R	N/A :: TOO
2031	Ocean Water Attenuation Coef, PAR	Clark	MODIS *	AM,PM	GSFC	PL	/m	35% :: 10%	1/day, 1/wk	1 km :: G	N/A :: TOO
2032	Ocean Water Attenuation Coef, PAR	Clark	MODIS *	AM,PM	GSFC	PL	/m	35% :: 10%	1/day, 1/wk	20 km :: G	N/A :: TOO
3206	Ocean Water Attenuation Coef@520nm, Beam	Clark	MODIS *	AM,PM	GSFC	PL	/m	:: 35%	1/day, 1/wk	1 km :: Ocean	N/A :: TOO
3207	Ocean Water Attenuation Coef@520nm, Beam	Clark	MODIS *	AM,PM	GSFC	PL	/m	:: 35%	1/day, 1/wk	20 km :: Ocean	N/A :: TOO
2608	Organic Matter Fraction	Clark	MODIS *	AM,PM	GSFC	PL	dimensionless	15% :: 10%	1/day, 1/wk	20 km :: Ocean	N/A :: TOO
3085	Suspended-Solids Conc, Ocean Water	Clark	MODIS *	AM,PM	GSFC	AL	g/m^3	50% :: 35%	1/day, 1/wk, 1/mo	20 km :: Ocean	N/A :: TOO
3086	Suspended-Solids Conc, Ocean Water	Clark	MODIS *	AM,PM	GSFC	AL	g/m^3	50% :: 35%	1/day, 1/wk, 1/mo	1 km :: Ocean/R,L	N/A :: TOO
2606	Ocean Productivity, Primary	Esaias	MODIS *	AM,PM	GSFC	AL	mg/m^3	<35% :: <20%	1/wk, 1/mo, 1/yr	20 km :: Ocean/G,R	N/A :: TOO
2556	Coccolith Backscatter Coef	Gordon	MODIS *	AM,PM	GSFC	PL	/m	25% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean/R	N/A :: TOO
2557	Coccolith Backscatter Coef	Gordon	MODIS *	AM,PM	GSFC	PL	/m	25% :: 10%	1/day, 1/wk, 1/mo	20 km :: Ocean	N/A :: TOO
2254	Glint Field	Gordon	MODIS *	AM,PM	GSFC	PL	dimensionless		1/orbit [d]	1 km :: Ocean/R	N/A :: Sfc
2559	Ocean Water Backscatter Coef, Total	Gordon	MODIS *	AM,PM	GSFC	PL	/m	25% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean/R	N/A :: TOO
2560	Ocean Water Backscatter Coef, Total	Gordon	MODIS *	AM,PM	GSFC	PL	/m	25% :: 10%	1/day, 1/wk, 1/mo	20 km :: Ocean	N/A :: TOO
2555	Phytoplankton Backscatter Coef	Gordon	MODIS *	AM,PM	GSFC	PL	soft, med, hard		1/day, 1/wk, 1/mo	1 km :: Ocean/R	N/A :: TOO
2558	Phytoplankton Backscatter Coef	Gordon	MODIS *	AM,PM	GSFC	PL	soft, med, hard		1/day, 1/wk, 1/mo	20 km :: Ocean	N/A :: TOO
1688	Wind Velocity, Sea_sfc Glint-Pattern	Gordon	MODIS *	AM,PM	GSFC	PL	m/s		1/orbit [d]	1 km :: Ocean/R	N/A :: Sfc
2416	*Level-2 Radiance, Water-leaving*	Gordon et al	MODIS *	AM,PM	GSFC	AL	mW/cm^2/sr/um	5% :: 5%	1/day, 1/wk, 1/mo	1 km :: Ocean/R,L	N/A :: Sfc
2417	*Level-2 Radiance, Water-leaving*	Gordon et al	MODIS *	AM,PM	GSFC	AL	mW/cm^2/sr/um	5% :: 5%	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R	N/A :: Sfc
2577	Coccolith Conc, Detached	Gordon, Clark	MODIS *	AM,PM	GSFC	AL	mg-CaCO3/m^3	30% :: 10%	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R	N/A :: TOO
2578	Coccolith Conc, Detached	Gordon, Clark	MODIS *	AM,PM	GSFC	AL	mg-CaCO3/m^3	30% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean/L	N/A :: TOO
3199	Ocean Water Attenuation Coef@490nm	Gordon, Clark	MODIS *	AM,PM	GSFC	AL	/m	25% :: 10%	1/day, 1/wk, 1/mo	20 km :: Ocean-I/ R,L	N/A :: TOO
3200	Ocean Water Attenuation Coef@490nm	Gordon, Clark	MODIS *	AM,PM	GSFC	AL	/m	25% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean-I/ R,L	N/A :: TOO
2591	Pigment Conc	Gordon, Clark	MODIS *	AM,PM	GSFC	AL	mg/m^3	30% :: 10%	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R	N/A :: TOO
2592	Pigment Conc	Gordon, Clark	MODIS *	AM,PM	GSFC	AL	mg/m^3	30% :: 10%	1/day, 1/wk, 1/mo	1 km :: Ocean/R,L	N/A :: TOO
3319	Chlorophyll Absorption Line Height	Hoge	MODIS *	AM,PM	GSFC	PL	mW/cm^2/sr/um	50% :: 15%	1 dy,wk,mo	20 km :: Ocean/GR	N/A :: TOO
3320	Chlorophyll Absorption Line Height	Hoge	MODIS *	AM,PM	GSFC	PL	mW/cm^2/sr/um	50% :: 15%	1 dy,wk,mo	1 km :: Ocean/RL	N/A :: TOO
2574	*Chlorophyll Fluorescence Line Curv*	Hoge	MODIS	AM,PM	GSFC	AL	mW/cm^2/sr/um	25% :: 8%	1/day, 1/wk	20 km :: Ocean	N/A :: TOO
2573	Chlorophyll Fluorescence Line Curv	Hoge	MODIS	AM,PM	GSFC	AL	mW/cm^2/sr/um	25% :: 8%	1/day, 1/wk	1 km :: Ocean/R	N/A :: TOO
3317	*Organic Matter Fluorescence Curv*	Hoge	MODIS *	AM,PM	GSFC	AL	mg/m^3	100% :: 50%	1 dy,wk,mo	20 km :: Ocean/GR	N/A :: TOO

MODIS Products by Discipline (Ocean)

Prod #	Revised Product Name	Investigator	Instrument	Platform	DAAC	Time frame	Units	Accuracy Abs :: Rel	Temporal Resolution	Horizontal Resol. :: Domain	Vertical Resol. :: Domain
3318	*Organic Matter Fluorescence Curv*	Hoge	MODIS *	AM,PM	GSFC	AL	mg/m^3	100% :: 50%	1 dy,wk,mo	1 km :: Ocean/RL	N/A :: TOO
2593	Pigment Conc (Curv)	Hoge	MODIS *	AM,PM	GSFC	PL	mg/m^3	35% :: 15%	1/day, 1/wk	1 km :: Ocean/R	N/A :: TOO
2594	Pigment Conc (Curv)	Hoge	MODIS *	AM,PM	GSFC	PL	mg/m^3	35% :: 15%	1/day, 1/wk	20 km :: Ocean/R	N/A :: TOO
3216	Particulate Backscatter Coef	Parslow	MODIS *	AM,PM	GSFC	PL	/m	:: 30%	1/day	1 km :: Ocean	N/A :: TOO
3217	Particulate Backscatter Coef	Parslow	MODIS *	AM,PM	GSFC	PL	/m	:: 30%	1/day	20 km :: Ocean	N/A :: TOO
2582	Organic Matter Conc, Dissolved	Parslow et al	MODIS *	AM,PM	GSFC	AL	mg/m^3	150% :: 30%	1/day, 1/wk, 1/mo	20 km :: Ocean [Southern]	N/A :: TOO
2583	Organic Matter Conc, Dissolved	Parslow et al	MODIS *	AM,PM	GSFC	AL	mg/m^3	150% :: 30%	1/day, 1/wk, 1/mo	1 km :: Ocean [Southern]R,L	N/A :: TOO
3153	Sea_Ice Max Extent	Salomonson	MODIS *	AM,PM	NSIDC	AL	km^2	<=5% :: <=5%	1/day, 1/wk, 1/mo	10 km :: Ocean/Cryo	N/A :: Sfc
3154	Sea_Ice Max Extent	Salomonson	MODIS *	AM,PM	NSIDC	AL	km^2	<=5% :: <=5%	1/day, 1/wk, 1/mo	1 km :: Ocean/Cryo,R	N/A :: Sfc

MODIS Products by Discipline (Atmosphere)

Prod #	Revised Product Name	Investigator	Instrument	Platform	DAAC	Time frame	Units	Accuracy Abs :: Rel	Temporal Resolution	Horizontal Resol. :: Domain	Vertical Resol. :: Domain
2330	PAR	Esaias	MODIS *	AM,PM	GSFC	PL	quanta/m^2/s	TBD :: TBD	1/day	N/A :: G	N/A :: Atmos
2295	*Aerosol Angstrom Exponent*	Gordon	MODIS *	AM,PM	GSFC	AL	dimensionless	15% :: 5%	1/day, 1/wk, 1/mo	1 km :: Ocean/R,L	N/A :: Atmos
2296	*Aerosol Angstrom Exponent*	Gordon	MODIS *	AM,PM	GSFC	AL	dimensionless	15% :: 5%	1/day, 1/wk, 1/mo	20 km :: Ocean	N/A :: Atmos
2344	*Aerosol Radiance*	Gordon	MODIS *	AM,PM	GSFC	AL	mW/cm^2/sr/um	10% :: 5%	1/day, 1/wk, 1/mo	1 km :: Ocean/G,R,L	N/A :: Atmos
2345	*Aerosol Radiance*	Gordon	MODIS *	AM,PM	GSFC	AL	mW/cm^2/sr/um	10% :: 5%	1/day, 1/wk, 1/mo	20 km :: Ocean/G,R,L	N/A :: Atmos
2266	PAR, Sfc (IPAR)	Gordon	MODIS *	AM,PM	GSFC	AL	quanta/m^2/s	10% :: 5%	1/day [d]	1 km :: Ocean/L	N/A :: Sfc
2267	PAR, Sfc (IPAR)	Gordon	MODIS *	AM,PM	GSFC	AL	quanta/m^2/s	10% :: 5%	1/day [d]	1 km :: Ocean	N/A :: Sfc
2286	Level-1B Radiance Mixture-Model, MODIS	Huete	MODIS *	AM,PM	GSFC	PL	dimensionless	5-10% :: 0.05	1/day	pixel_size :: G	N/A :: Sfc
2068	Cloud Field Area	Kaufman	MODIS	AM,PM	GSFC	PL	km^2		1/mo	1 dg :: G	N/A :: Sfc
2092	Cloud Field Perimeter	Kaufman	MODIS	AM,PM	GSFC	PL	km		1/mo	1 dg :: G	N/A :: Sfc
1017	*Aerosol Mass Loading*	Kaufman, Tanre	MODIS *	AM,PM	GSFC	AL	g/m^2	30% :: 10%	1/day,1/mo	0.5 dg :: G,R	N/A :: Atmos
2293	*Aerosol Optical Depth, Spectral*	Kaufman, Tanre	MODIS *	AM,PM	GSFC	AL	dimensionless	0.1 :: 0.05	1/day, 1/mo	0.5 dg :: Land	N/A :: Atmos
1874	Precipitable Water	Kaufman, Tanre	MODIS	AM,PM	GSFC	AL	dimensionless ?	8% :: 6%	1/day	5 km :: Land	N/A :: Atmos
3321	Precipitable Water	Kaufman, Tanre	MODIS	AM,PM	GSFC	AL	dimensionless ?	12% :: 8%	1 dy, mo	1 km :: Land	N/A :: Atmos
3322	Precipitable Water	Kaufman, Tanre	MODIS	AM,PM	GSFC	AL	dimensionless ?	5% :: 3%	1 dy, mo	1 dg :: Land	N/A :: Atmos
2081	Cloud Cover	King	MODIS	AM,PM	GSFC	AL	%	10% :: 5%	2/day [d,n], 1/mo	5 km :: G	N/A :: Cloud
2082	Cloud Cover	King	MODIS	AM,PM	GSFC	AL	%	10% :: 5%	1/day, 1/mo	1 dg :: G	N/A :: Cloud
1764	Cloud Drop Phase	King	MODIS	AM,PM	GSFC	AL	water/ice	90% Conf :: 90% Conf	1/day	5 km :: G	N/A :: Cloud
1765	Cloud Drop Phase	King	MODIS	AM,PM	GSFC	AL	water/ice	90% Conf :: 90% Conf	1/day, 1/mo	1 dg :: G	N/A :: Cloud
2311	*Cloud Optical Depth*	King	MODIS	AM,PM	GSFC	AL	dimensionless	20% :: 10%	1/day [d]	5 km :: G	N/A :: Cloud
2312	*Cloud Optical Depth*	King	MODIS	AM,PM	GSFC	AL	dimensionless	20% :: 10%	1/day, 1/mo	1 dg :: G	N/A :: Cloud
1780	Cloud Drop Size(Effective Radius)	King, Menzel	MODIS	AM,PM	GSFC	AL	um	0-40% :: 5%	1/day	5 km :: G	N/A :: Cloud
1781	Cloud Drop Size(Effective Radius)	King, Menzel	MODIS	AM,PM	GSFC	AL	um	0-40% :: 5%	1/day, 1/mo	1 x 1 dg :: G	N/A :: Cloud
2094	Cloud JPDF	King, Menzel	MODIS	AM,PM	GSFC	PL	dimensionless		1/day, 1/mo	1 dg :: G	N/A :: N/A
2126	*Cloud Emissivity*	Menzel	MODIS	AM,PM	GSFC	AL	dimensionless	0.10 :: 0.05	2/day	5 km :: G	N/A :: Cloud
2127	*Cloud Emissivity*	Menzel	MODIS	AM,PM	GSFC	AL	dimensionless	0.10 :: 0.05	1/day, 1/mo	1 dg :: G	N/A :: Cloud
2116	Cloud Emissivity	Menzel	MODIS	AM,PM	GSFC	PL	dimensionless				N/A :: Cloud
1528	Cloud Pressure, Top	Menzel	MODIS	AM,PM	GSFC	AL	mb	50 mb :: 20 mb	2/day	5 km :: G	N/A :: Cloud
1529	Cloud Pressure, Top	Menzel	MODIS	AM,PM	GSFC	AL	mb	50 mb :: 20 mb	1/day, 1/mo	1 dg :: G	N/A :: Cloud
2466	*Cloud Temperature, Top*	Menzel	MODIS	AM,PM	GSFC	AL	C	2 C :: 1 C	1/day, 1/mo	1 dg :: G	N/A :: Cloud
2467	*Cloud Temperature, Top*	Menzel	MODIS	AM,PM	GSFC	AL	C	2 C :: 1 C	2/day	5 km :: G	N/A :: Cloud
1333	O3 Total Burden	Menzel	MODIS	AM,PM	GSFC	AL	DU	15-20DU :: 10DU	2/day, 1/day	5 km :: G	Column :: Atmos
1334	O3 Total Burden	Menzel	MODIS	AM,PM	GSFC	AL	DU	15-20DU :: 10DU	1/day, 1/mo	0.5 dg :: G	Column :: Atmos
1875	Precipitable Water	Menzel	MODIS	AM,PM	GSFC	AL	mm	10 mm :: 5 mm	2/day	5 km :: G	N/A :: Atmos
1559	Stability (Lifted Index), Atmospheric	Menzel	MODIS	AM,PM	GSFC	AL	C	2 C :: 1 C	2/day	5 km :: G	N/A :: Atmos
1560	Stability (Lifted Index), Atmospheric	Menzel	MODIS	AM,PM	GSFC	AL	C	2 C :: 1 C	2/day, 1/mo	0.5 dg :: G	N/A :: Atmos
2001	Albedo, Planetary Spectral, TOA	Muller, Strahler	MODIS *	AM,PM	GSFC	AL	fraction	10% :: 5%	1/(3-8 day)	2.5 km :: Land/R	N/A :: Sfc
2282	Cloud Masking-shadowing	Salomonson	MODIS	AM,PM	GSFC	AL	dimensionless	5% ::	1/day	.25 km :: G	N/A :: Sfc
2283	Cloud Masking-shadowing	Salomonson	MODIS	AM,PM	GSFC	AL	dimensionless	30% ::	1/day	1 km :: G	N/A :: Sfc
2284	Cloud Masking-shadowing	Salomonson	MODIS	AM,PM	GSFC	AL	dimensionless	15% ::	1/day	0.5 km :: G	N/A :: Sfc
2338	Level-1B Radiance, MODIS<3um	Salomonson	MODIS	AM,PM	GSFC	AL	W/m^2/sr/um	5%(1Σ) :: RMS<NEdL	1/day	0.5 km :: G	N/A :: N/A
2339	Level-1B Radiance, MODIS<3um	Salomonson	MODIS	AM,PM	GSFC	AL	W/m^2/sr/um	5%(1Σ) :: RMS<NEdL	1/day	1 km :: G	N/A :: N/A
2392	Level-1B Radiance, MODIS<3um	Salomonson	MODIS	AM,PM	GSFC	AL	W/m^2/sr/um	5%(1Σ) :: RMS<NEdL	1/day	0.25 km :: G	N/A :: N/A
2340	Level-1B Radiance, MODIS>3um	Salomonson	MODIS	AM,PM	GSFC	AL	W/m^2/sr/um	1%(1Σ) :: RMS<NEdL	1/day	1 km :: G	N/A :: N/A
3641	*Cloud Cover*	Salomonson?	MODIS	AM,PM	GSFC	AL	%	10% :: 5%	1/mo (day & night)	0.25 km :: G	N/A :: Cloud
2268	PAR, Incident, (IPAR)	Tanre	MODIS *	AM,PM	EDC	PL	MJ/m^2	200 :: 5 - 20%	1/day, 1/wk	1 km :: G,R	N/A :: Atmos
2294	*Aerosol Optical Depth, Spectral*	Tanre, Kaufman	MODIS *	AM,PM	GSFC	AL	dimensionless	0.05 :: 0.02	1/day, 1/mo	0.5 dg :: Ocean	N/A :: Atmos
1022	*Aerosol Size-distribution (Radius-Dispersion)*	Tanre, Kaufman	MODIS *	AM,PM	GSFC	AL	um, dimensionless	10-30% :: 10%	1/day,1/mo	0.5 dg :: G,R	N/A :: Atmos
2003	*Albedo, Aerosol*	Tanre, Kaufman	MODIS	AM,PM	GSFC	PL	dimensionless	0.06 :: 0.03	1/day, 1/mo	0.5 dg :: G,R	N/A :: Atmos
1556	Land_sfc Roughness	Tanre, Muller	MODIS *	AM,PM	EDC	PL	dimensionless	15% :: 5 - 8%	1/day, 1/wk	1 km :: G,R	N/A :: Sfc
1557	Land_sfc Roughness	Tanre, Muller	MODIS *	AM,PM	EDC	PL	dimensionless	15% :: 5 - 8%	1/day, 1/wk	10 km :: G,R	N/A :: Sfc

MODIS Products by Discipline (Instrument/Calibration)

Prod #	Revised Product Name	Investigator	Instrument	Platform	DAAC	Time frame	Units	Accuracy Abs :: Rel	Temporal Resolution	Horizontal Resol. :: Domain	Vertical Resol. :: Domain
3303	Calibration Data, MODIS	Evans	MODIS *	AM,PM	GSFC	AL	variable		1/day, 1/wk, 1/mo	N/A :: Ocean/G,R,L	N/A :: Sfc
3304	Data Characteristics, MODIS	Justice, Strahler	MODIS *	AM,PM	GSFC	PL	dimensionless	30,10, 5% ::	1/day	1 km :: G	N/A :: Sfc
3305	Data Characteristics, MODIS	Justice, Strahler	MODIS *	AM,PM	GSFC	PL	dimensionless	30,10, 5% ::	1/day	10 km :: G	N/A :: Sfc
3306	Data Characteristics, MODIS	Justice, Strahler	MODIS *	AM,PM	GSFC	PL	dimensionless	30,10, 5% ::	1/day	50 km :: G	N/A :: Sfc
3656	Geometric Error, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3657	Geometric Error, MODIS Level-3	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3645	Instrument Characteristics, MODIS Level-1	Salmonson, Barker	MODIS	AM,PM	GSFC	AL					
3648	Instrument Model, MODIS Level-1	Salmonson, Barker	MODIS	AM,PM	GSFC	AL					
3652	Irradiance, Lunar, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3651	Irradiance, Solar, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3654	Radiance Error, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	AL					
3646	Radiance, At-Satellite, MODIS Level-1	Salmonson, Barker	MODIS	AM,PM	GSFC	AL					
3650	Radiance, Lunar Reference, MODIS Level-1	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3649	Radiance, Solar Diffuser, MODIS Level-1	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3655	Reflectance Error, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3647	Reflectance, Exoatmospheric, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	AL					
3653	Reflectance, Lunar, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3658	Texture, MODIS Level-2	Salmonson, Barker	MODIS	AM,PM	GSFC	AL					
3659	Texture, MODIS Level-3	Salmonson, Barker	MODIS	AM,PM	GSFC	PL					
3660	Classification Masks, Clouds/Snow/Land/Water, MODIS Level-2	Salmonson, Barker (with Hall)	MODIS	AM,PM	GSFC	AL					
3661	Classification Masks, Clouds/Snow/Land/Water, MODIS Level-3	Salmonson, Barker (with Hall)	MODIS	AM,PM	GSFC	PL					