Beta and Version 1
MODIS Software Deliveries

Ed Masuoka
Code 920
GSFC/NASA

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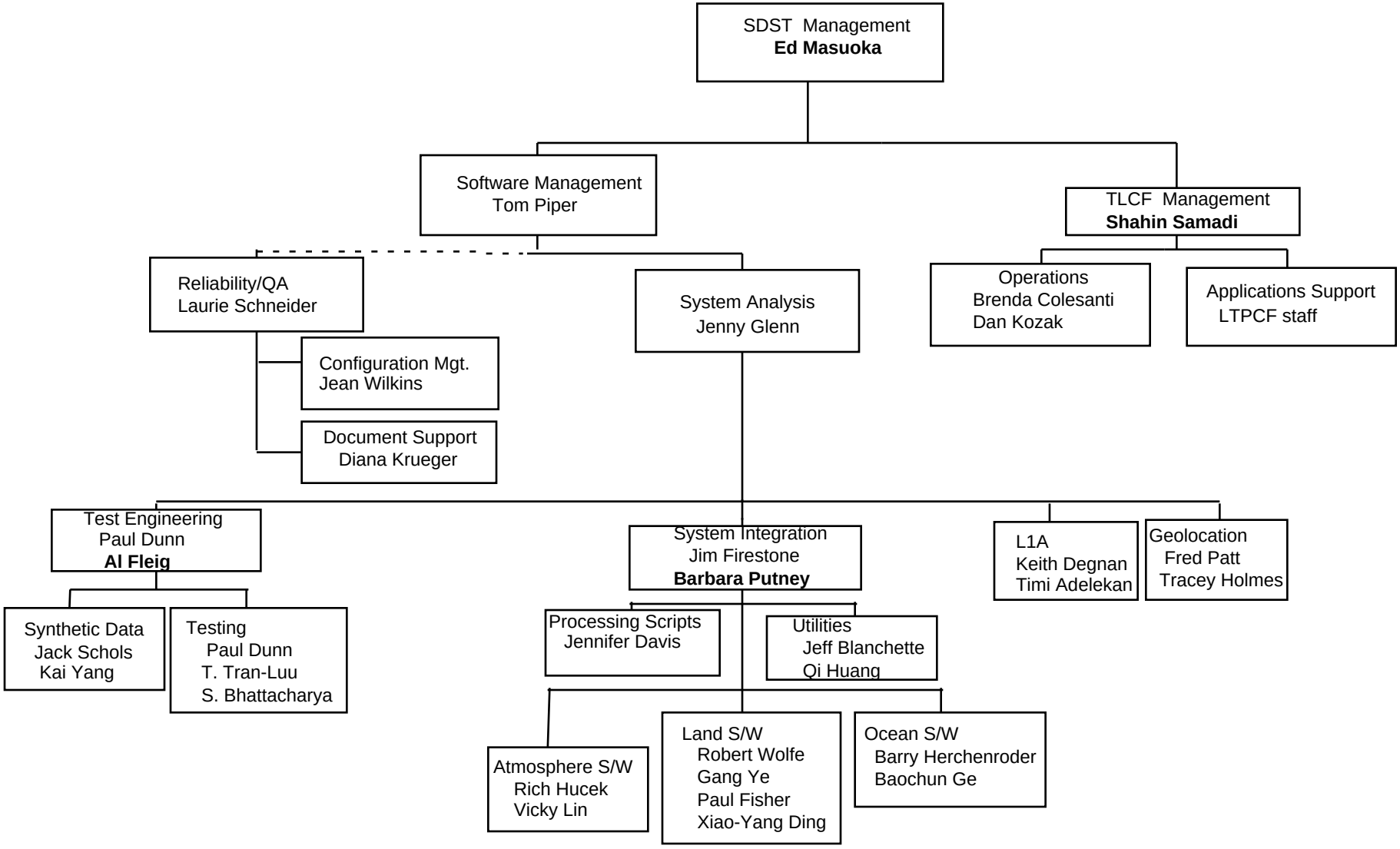
Beta Good News

- MODIS has developed a 16 day simulated data set for testing processing flow
- MODIS will deliver a system in Beta that will run end-to-end (from L0 packets to L3 products) with the simulated data
- Most MODIS products will be delivered to the GSFC DAAC and will run in integrated processing strings
- MODIS software is using HDF for I/O with wrappers that handle error checking (M-API)

Other News

- All Level 2 products won't be in Beta
- Products won't have metadata in PVL format
- MODIS software required waivers for I*2
- Model of MODIS processing in EOSDIS does not handle Level 3 production
- MODIS Level 3 processing will be hard to test in the DAAC until Release B
- Startup problems with the high speed ATM link to EROS Data Center
- Version 1 SCF Plan is late

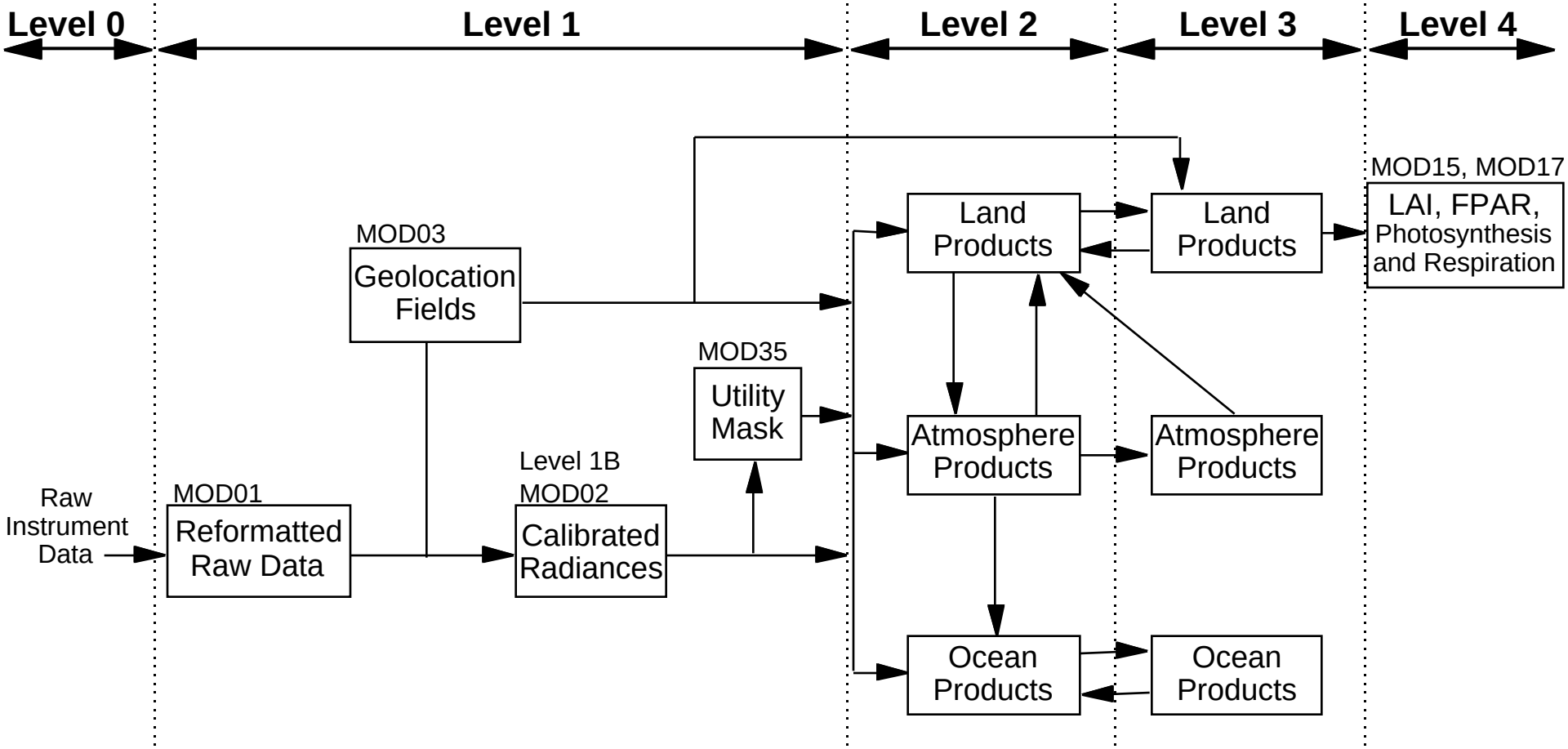
SDST Staff


SDST Management
Ed Masuoka
Software Management
Tom Piper
TLCF Management
Shahin Samadi
Reliability/QA
Laurie Schneider
System Analysis
Jenny Glenn
Operations
Brenda Colesanti
Dan Kozak
Applications Support
LTPCF staff
Configuration Mgt.
Jean Wilkins
Document Support
Diana Krueger
Test Engineering
Paul Dunn
Al Fleig
System Integration
Jim Firestone
Barbara Putney
L1A
Keith Degnan
Timi Adelekan
Geolocation
Fred Patt
Tracey Holmes
Synthetic Data
Jack Schols
Kai Yang
Testing
Paul Dunn
T. Tran-Luu
S. Bhattacharya
Processing Scripts
Jennifer Davis
Utilities
Jeff Blanchette
Qi Huang
Atmosphere S/W
Rich Hucek
Vicky Lin
Land S/W
Robert Wolfe
Gang Ye
Paul Fisher
Xiao-Yang Ding
Ocean S/W
Barry Herchenroder
Baochun Ge

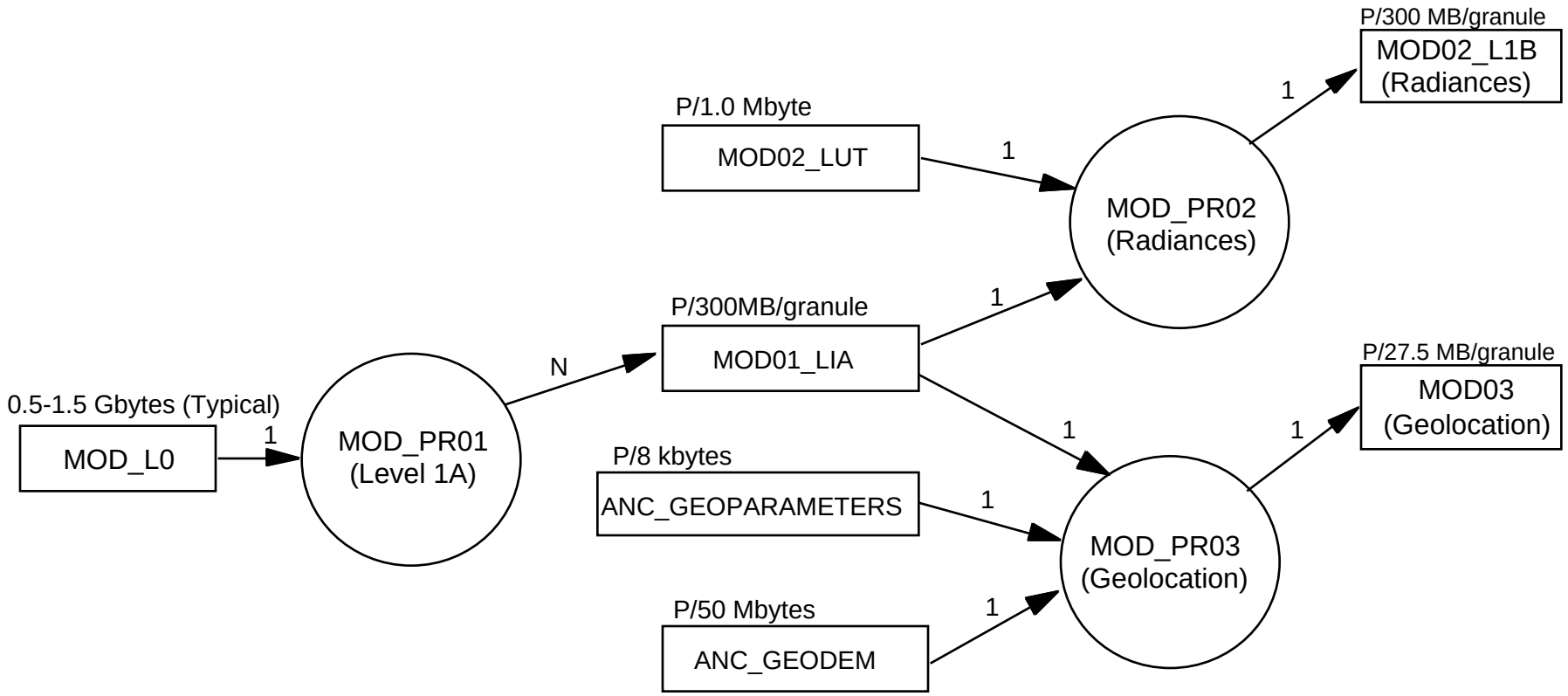
Deliverables Under Team Leader Working Agreement

• Science Computing Facilities Plan	6/94, **1/96**
• Algorithm Theoretical Basis Documents	10/95
• Software Management Plan	10/95
• Data Management Plan	10/95, 7/96
• Operations Manual for ß,V1 ,V2	11/95,10/96,10/97
• Science Data Validation Plan	**12/95**, 10/96
• Beta Software and Test Data for ß,V1 ,V2	1/96, 12/96, 11/97
• Updates to software after V2	3/98 and TBD

MODIS Product Generation



Thread 1



Revised: 9/18/95
Reviewed by: Degnan

MODIS PRODUCT DESCRIPTIONS

- THE PRODUCT DEFINITIONS WILL EVOLVE
- CURRENT HDF SPECIFICATIONS WILL CHANGE
  - VERSION 1 SPECs WILL BE BASELINED IN Q1 1996
- WE ARE LOOKING FOR INPUT FROM USERS
- FOUR FILE DESCRIPTIONS ARE ON-LINE
  - HDF FILE FORMATS,
  - ICD TECHNICAL PRODUCT SUMMARIES,
  - ATBDs MATHEMATICAL SPECIFICATIONS,
  - INFORMATIONAL PRODUCT SUMMARIES

WHERE TO FIND PRODUCT DESCRIPTIONS

- HDF AND ICD SPECs ARE ON MODIS ANONYMOUS FTP SITE
  - ltpftp.gsfc.nasa.gov (ip address 128.183.10.134)
  - IN /projects/modis/stig/hdf AND /projects/modis/icd
- ATBDs CAN BE FOUND ON THE EOS PROJECT SCIENCE OFFICE WORLD WIDE WEB SITE
  - AT http://spso.gsfc.nasa.gov/atbd/pg1.html
- PRODUCT SUMMARY DESCRIPTIONS ARE ON MODARCH WORLD WIDE WEB SITE
  - http://modarch.gsfc.nasa.gov/MODIS/DATAPROD/dataprodcat.html

Software in the TLCF

- Autosys Job Scheduler
- QA/FORTRAN&C Standards Checkers
- FORCHECK* Standards Checker
- Sentinel Memory Leaks
- IMSL* Math Library
- IDL * Graphics Package

* Available for Science Team SCFs, contact Masuoka for further information

96 TLCF Plans

- Acquire storage required for prototyping and testing
  - Requirements for large test and development data sets on the TLCF
- Mangement of online disk storage
  - DST based nearline storage (5TB)
  - Interface to database for metadata searches
- Solve high speed network issues in the GSFC to EDC connection

Beta Science Product Deliveries

- Atmosphere Level 2 Products
  - Beta Delivery Complete
- Ocean Color Delivery
  - Delivered: MOD18, MOD19, MOD21, MOD25, MOD26, MOD27, MOD37, MOD39 using SeaWiFS I/O
  - Beta Delivery Completed
- Land Level 2 Products
  - Beta Delivery Complete
- Land Level 2g-3 Processing String
  - Delivered: MOD09/13/14
  - Beta Delivery Completed
- Land L3 Delivery
  - Delivered: MOD10, MOD11, MOD12, MOD29
  - Missing: MOD33, MOD34, MOD40, MOD42
  - Removed from Beta MOD15, MOD17

Purpose of Science Software Integration

- Integrate L2 and L3 software processes supplied by the STMs into processing threads running at the DAACs.
- Support the STMs in integrating the necessary interface tools (SDP toolkits, HDF, gridding, etc.) into their software.
- Translate an understanding of algorithm and product requirements into a robust, efficient, and maintainable SDPS producing all required MODIS output products.
- Develop a SDPS which will accommodate evolving science algorithms

SDP S/W Release Goals

Beta (January 1996):

- All delivered science software integrated into system
- SDP TK integrated into science software
- Products stored in HDF format according to product specification

Version 1 (December 1996):

- Complete at-launch science algorithms implemented
- Better coordination of science software
- Ancillary and LUT data are used
- Realistic resource usage, timing and operations
- Uses ECS metadata and *swath/grid constructs*
- *Integration with the Scheduler and Data Server*

SDP S/W Releases

Version 2 (November 1997):

- Fully integrated science software, both within and between disciplines (Land, Ocean and Atmosphere)
  - Fully tested
  - Complete operations and user's guides
  - Q/A, validation, and analysis software completed for SCFs
  - Uses ECS swath and grid
- Delta delivery in 2/98

Post Launch (Q4 1998):

- Level 1 products available after 90 day check-out
- Debug Level 1, 2, 3 software simultaneously

Oceans Software Delivered in Beta

- SeaWiFS based Ocean Color - Evans
  - MOD18 Atmospheric Correction - Gordon
  - MOD19 Pigment Concentration - Clark
  - MOD21 Chlorophyll - Clark & Carder
  - MOD22 PAR, IPAR - Carder (Gordon)
  - MOD25 Detached Coccolith - Gordon
  - MOD26 Ocean Water Atten. - Clark
  - MOD37 Aerosol Properties - Gordon
- MOD27 Productivity - Esaias

Version 1 Oceans Deliveries

- **Sea Surface Temperature Suite - Evans**
  MOD20 Fluorescence - Abbott
  MOD23 Suspended Matter - Clark
  MOD24 Organic Matter - Clark, Carder, Parslow
  MOD28 Sea Surface Temperature - Brown
  MOD31 Phycoerythrin Conc. - Hoge
  MOD32 Matchup Database - Evans
  MOD36 Absorption Coef. - Carder
  MOD37 Aerosol Properties - Gordon
- **MODIS-based Ocean Color - Evans**
- **MOD27 Productivity - Esaias**

Version 1 Oceans Software Plans

- Scheduled Deliveries
  - 10/ 95 SeaWiFS Ocean Color code modified to run in DAAC (SDST/Miami)
  - 3/96 SeaWiFS HDF I/O library replaced with MODIS HDF I/O (SDST)
  - 4/96 Ocean Color in Fortran 90 with waivers removed (Miami)
  - 6/96 SST Product suite based on Ocean Color framework (Miami)
- What is involved
  - Changing SeaWiFS I/O to MODIS I/O by replacing the SeaWiFS I/O library with current MODIS I/O or Swath and Grid *if defined*
  - Replacing non-compliant Fortran with Fortran 90
  - Removing Integer*2 from Fortran

Version 1 Land Software Plans

- Scheduled Deliveries
  - 11/ 95 Level 2 and some Level 3 products for Beta
  - 2/96 Version 1 product formats baselined
  - 4/96 Level 2 products for Version 1
  - 6/96 Level 3 and 4 products for Version 1
- What is involved
  - Modify metadata to ESDIS standards (SDST)
  - Modify I/O to use Swath and Grid if defined
  - Test tiling routines in production with large data volumes (Land/SDST)
  - Coordinate processing between algorithms (Land)
  - Define Q/A flags in products and handle appropriately in processing (Land)
  - Enhance synthethic test data (SDST)

Version 1 Atmosphere Software Plans

- Scheduled Deliveries
  - 11/ 95 Level 2 Beta products
  - 2/96 Version 1 product formats baselined
  - 2/96 Beta version of L3 products needed by Land
  - 3/96 Level 2 V1 products
  - 6/96 Level 3 V1 products
- What is involved
  - Get Level 3 algorithms developed (Atmosphere)
  - Develop a tiling scheme if needed possibly use Land scheme(Atmosphere/SDST)
  - Coordinate processing between algorithms (Atmosphere/SDST)
  - Modify metadata to ESDIS standards (SDST)
  - Define Q/A flags in products and handle appropriately in processing (Atmosphere)
  - Enhance synthethic test data (SDST)

Version 1 Review Schedule

12/95 Level 1B Critical Design Review

11/95 V1 System Requirements Review

3/96 System Preliminary Design Review

3/96 L1A /Geolocation Design Review

5/96 System Critical Design Review

10/96 System Test Readiness Review

11/96 Operations Readiness Review

V1 Document Schedules

1/96	Final SCF Plan
5/96	Version 1 System Description Document
6/96	Version 1 Test Plan
6/96	Product File Description Document
7/96	Data Management Plan
10/96	Operations Manual
11/96	DAAC SSI&T Procedures

MODIS Process ID	Number of Source Files	SLOC (thousands)	Daily Product Volume (GB)	Process Load MFLOPS
MOD_PR01	34	5.7	115.2	100.0
MOD_PR02	81	11.8	180.3	1,300.0
MOD_PR03	49	11.0	15.7	41.1
MOD_PR04L	4	7.6	0.1	~50.0*
MOD_PR04S			1.4	
MOD_PR05	8	4.5	1.6	14.0*
MOD_PR06OD	6	6.6	2.4	1317.4*
MOD_PR06CT			9.3	100.0
MOD_PR06IR	6	3.5	0.3	
MOD_PR07	36	8.4	7.6	171.4
MOD_PR09B_1day	18	7.2		240.0
MOD_PR09B_16day	12	12.1	10.9	688.0
MOD_PR10_L2	4	2.5	0.4	0.1
MOD_PR10_L2G				
MOD_PR10_L3			0.5	0.1
MOD_PR11	11	11.0	6.3	3.4
MOD_PR11_L2G				
MOD_PR11_L3			0.6	0.1
MOD_PR12	26	22.7	0.1	208.0
MOD_PR09/13/14	23	8.2	21.3	300.0*
MOD_PR09/13G/14G	16	10.5		
MOD_PR15			0.2	<0.1
MOD_PR16			3.1	13.4
MOD_PR17			0.1	<0.1
MOD_PR18	288	~140.0	50.7	337.0
MOD_PR27	9	6.0	0.2	
MOD_PR29	4	2.9	0.8	0.1
MOD_PR33			0.6	<0.1
MOD_PR34			16.8	11.1
MOD_PR35	25	5.4	3.2	158.6*
MOD_PR40			0.4	0.2
MOD_PR42			0.3	13.6

* Based on delivered Beta 3 code. Otherwise, MFLOPS value represents number taken from Volumes and Loads Document.

Version 1 Work Topics

- Version 1 delivery defined
  - use Beta experiences to plan for Version 1
- Version 1 schedule baselined
- MODIS grids defined
- Ancillary data sets and pre-processing defined
- Metadata-EOS and MODIS format differences
- EOS Swath and Grid

Version 1 Topics (cont.)

- Simulated data - requirements definition
- SCF Planning
  - SCFs, TLCF and production sites ops concept
  - resources needed by team in V1 and beyond
  - scheduling/management of storage
  - Pathfinder experiences

Version 1 Issues (cont.)

- Programmer training
- ECS schedules and MODIS needs
- ECS evaluation
- Utilities for at-launch
  - production of images
  - comparision of datasets
  - handling validation data