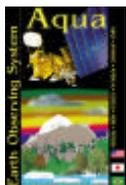# MODIS
SDST, STTG and SDDT

MODIS Science Team Meeting
(Land Discipline Breakout Session)

July 13, 2004

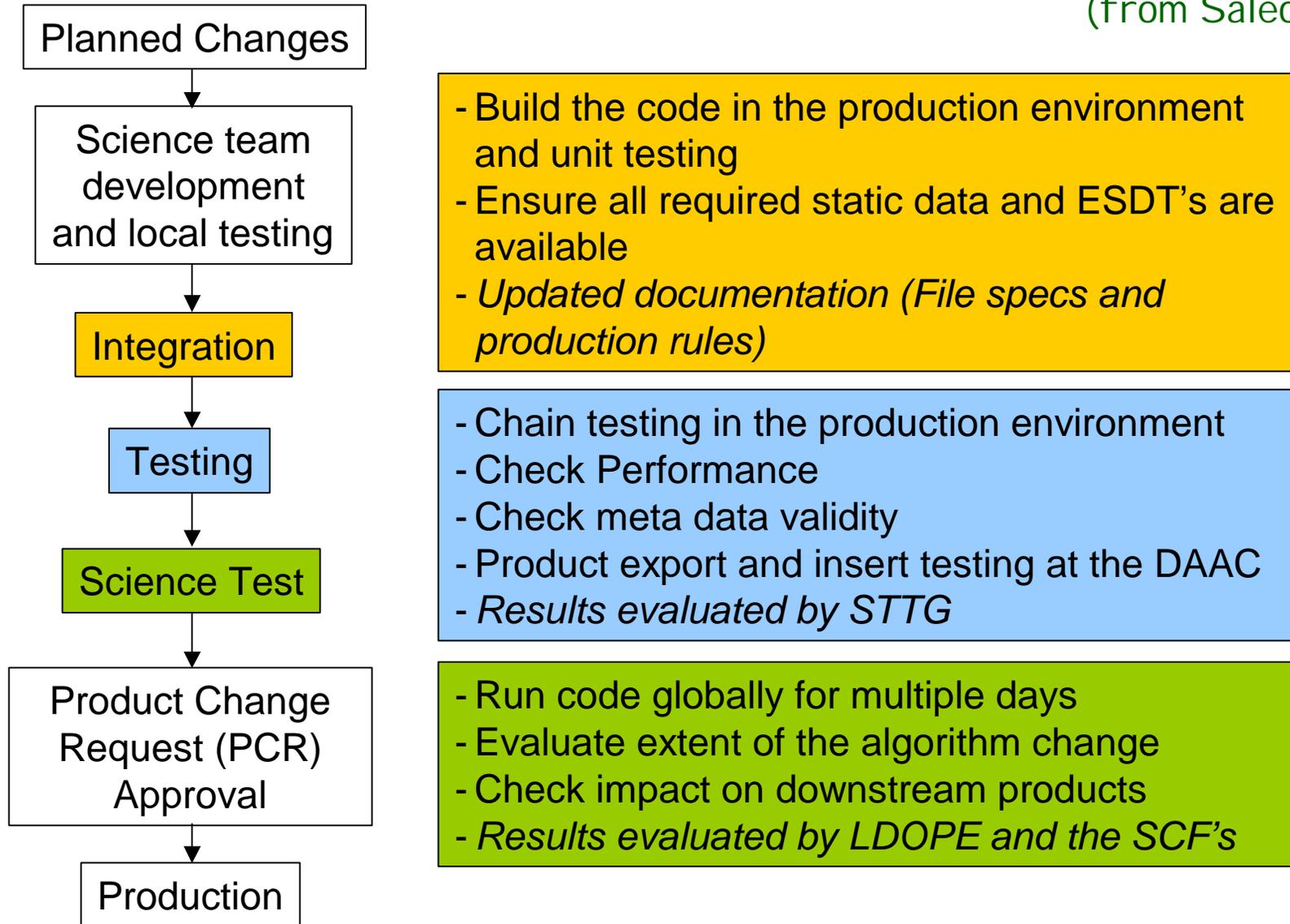### Robert Wolfe

Raytheon ITSS @
NASA GSFC Code 922

Support Organization

- ## Science Data Support Team (SDST)
- ## Science Software Transfer and Testing (STTG)
- ## Science Data Discipline Team (SDDT)

Software life cycle

(from Saleous)

```
Planned Changes
       |
       v
Science team
development
and local testing
       |
       v
Integration
       |
       v
Testing
       |
       v
Science Test
       |
       v
Product Change
Request (PCR)
Approval
       |
       v
Production
```

- Build the code in the production environment and unit testing
- Ensure all required static data and ESDT's are available
- *Updated documentation (File specs and production rules)*

- Chain testing in the production environment
- Check Performance
- Check meta data validity
- Product export and insert testing at the DAAC
- *Results evaluated by STTG*

- Run code globally for multiple days
- Evaluate extent of the algorithm change
- Check impact on downstream products
- *Results evaluated by LDOPE and the SCF's*

Science Data Support Team (SDST)

- Mission is to support the MODIS science team in the generation of MODIS science products
  - Integration and testing of Science Team developed science software
  - MODIS Adaptive Processing System (MODAPS) system development and maintenance
  - Data production
  - Quality assurance
- Led by Ed Masuoka
- Funded though the science team leader proposal and ESDIS project (MODAPS)
- Located in the Terrestrial Information Systems Branch (Code 922) at the NASA GSFC Goddard Space Flight Center Laboratory for Terrestrial Physics

Within the SDST envelope

- L1a and Geolocation
- MODAPS
- SDDT
- STTG
- Land Data Operational Product Evaluation facility (LDOPE)
- PI Processing
- Rapid response

Software Integration and Test (STTG)

- Receiving science software and integrating it with production rules to generate Process Generation Executives (PGEs) for L2 through L4 processing
  - includes documenting the PGEs, production rules, and internal procedures
  - developing and maintaining MODIS specific utility code
  - interacting with the EOSDIS Core System (ECS) staff in the generation of Earth Science Data Type (ESDT) information to allow science products to be inserted into the DAACs
- L1A and Geolocation
  - development and maintenance of L1A software (L0 to L1A)
  - development and maintenance of geolocation algorithm and software and performing error and trend analysis
- Testing L1A/Geolocation, cloud mask, L1B PGEs and delivering these PGEs to the GDAAC for operational processing
- Configuration management to controlling the evolution of the PGEs and MODAPS
- Operating a science test environment in support of science team's end-to-end science algorithm testing

MODAPS development/maintenance

- MODAPS system is the production system for L2 and higher science products
  - Land and atmosphere products (except for cloud mask)
  - Ocean's SST (other oceans products at OCDPS)
- Develops and maintains the MODAPS production software and hardware environment for both IRIX and distributed Linux environments
  - includes maintenance of development environment and science test environment
- Large production systems capable of production rates of more than 9X (for forward processing, reprocessing, science testing and development) – it consists of
  - four multi-processor SGI hosts; more than 150 CPUs
  - network connected Linux processors spread across SGI hosts; more than 200 CPUs
  - large high speed disk storage; over 100 TB

Data Production

- Generates MODIS science products on on a 7x24h basis
- Reports plans and accomplishments, and interacts with the MODIS PIs to generate long range processing plans
- Generates daily production plans for operations staff and reconciles production with the science products archived at the DAACs
- Documents operational and production procedures
- Conducts performance testing and processing special requests from the science disciplines
- Operates a rapid response data system for generating special data products within hours of real time to support such activities as fire fighting
- Performs sustaining engineering to support the on-going evolution of the hardware and system software

Processing Driven by Production Rules

- Required and optional inputs
  - Upstream products, ancillary data
  - How long to wait
- Processing Period
  - 5 min., orbit, 1, 8, 16, 32 or 96 days, calendar months, calendar years
- All granules (scenes) intersecting tiles
- Start of period (reset at beginning of year, 2-3 day overlap at end of year)

Quality assurance (QA)

- Conducts QA reviews of atmospheres and oceans science products and interacts with the PIs to develop plans for corrective action if necessary
- Supports maintenance of discipline specific websites identifying product quality issues
- Operates the Land Data Operational Product Evaluation (LDOPE) facility for land data assessment, interacting with the land science team to improve science algorithm performance (see Roy's slides)
- MODIS science team members maintain primary responsibility for product QA

SDST interaction

- STTG is the primary interface between science team developers and the production system
  - Carol Collins (ccollins@saicmodis.com) is the point of contact for Land
  - Science software delivery guide describes this interaction and gives details needed for MODIS production software – new version should be available in 2 weeks (see http://ltpwww.gsfc.nasa.gov/MODIS/SDST/documents.html)
- MODAPS provides an interface for science team to order data
  - MODAPSWEB (next slide)
  - Opsmail (opsmail@gscmail.gsfc.nasa.gov) is the primary point of contact
- Subscriptions to data from MODAPS are provided on a case-by-case basis
  - important: distribution capacity is limited

SDST web sites

http://ltpwww.gsfc.nasa.gov/MODIS/SDST

http://moddev.nascom.nasa.gov:8399

Science Data Discipline Team

- Works with discipline chairman (Chris Justice for Land) to organize/manage discipline science team
- Oversees discipline production
  - monitors production on a daily basis and deals with any production issues that may arise
  - communicates production status to the discipline
  - represents discipline at production planning meetings (PIP meetings)
  - works to maintain science team subscriptions to science team members
  - maintains flow of subsets
- Supports discipline telecons and meetings
- Organizes science tests
- Works with DAACs on product distribution

Land SDDT interaction

- ## Overall
  - Robert Wolfe (robert.wolfe@gsfc.nasa.gov)

- ## Production
  - Nazmi Saleous (nazmi.saleous@gsfc.nasa.gov)

SDDT web pages

http://landweb.nascom.nasa.gov/developers

http://landweb.nascom.nasa.gov/prod_www