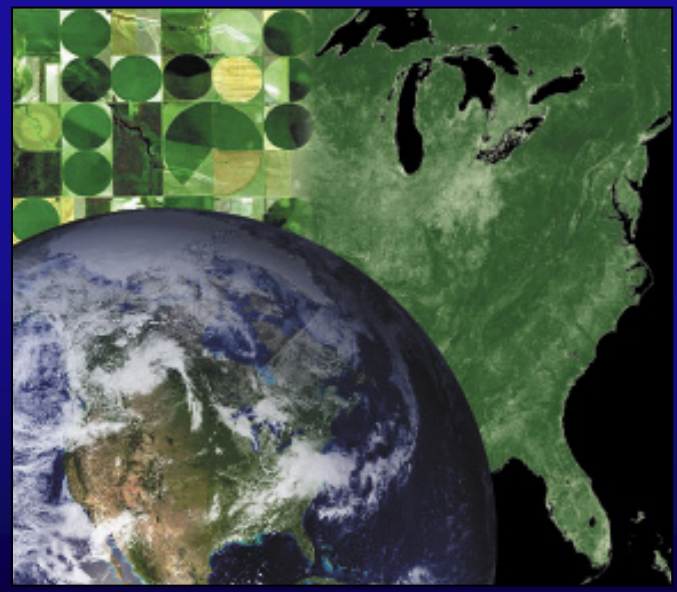
LP DAAC Evolution Status

Land Processes DAAC (LP DAAC) User Working Group

August 22-23, 2007



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Agenda

- EOSDIS Evolution Goals
- ECS/SDPS Evolution Goals
- ECS Milestone Status Update
- LP DAAC Integration & Simplification
- LP DAAC Schedule
- Post-ECS Evolution considerations

Core: Evolving EOSDIS

- In early 2005, NASA embarked on an EOSDIS Evolution Study
- Address multi-faceted goals/issues:
  - Manage archive volume growth
  - Improve science need response and data access
  - Reduce recurring costs of operations and sustaining engineering
  - Update age of systems and components
  - Move towards more distributed environment
- A vision for the 2015 timeframe was developed to guide conduct of study
- EOSDIS Evolution “Step 1” Plan approved by NASA Headquarters in late 2005.

Features of EOSDIS Evolution (1 of 3)

- **Migration to commodity-based hardware**
  - **reduces maintenance and technology refresh costs**

- **Transfer responsibility for archive and distribution of MODIS Level 0, Level 1, and Atmosphere (Level 2) data from Goddard DAAC to MODIS data processing facility (MODAPs)**
  - **Move from archiving all products to on-demand production of Level 1**
  - **Decrease archive size and slow future growth; facilitates transition to disk-based archive (all data on-line)**
  - **Closer relationship/control by science community expected to be more responsive to science needs, products, tools**

Features of EOSDIS Evolution (2 of 3)

- **Rearchitect EOSDIS Core System (ECS) to reduce footprint; simplify system (removes 750K SLOC (current baseline 1.2M SLOC) and 15 S/W Components)**
  - **Reduced operations/sustaining engineering costs**
  - **Improved performance**

- **At Goddard and Langley DAACs, consolidate data holdings into single, in-house developed system at each DAAC (currently operating ECS and heritage systems at both DAACs)**
  - **Reduction in operations costs due to elimination of multiple systems**

Features of EOSDIS Evolution (3 of 3)

- **Earth science ClearingHOuse (ECHO)**
  - **Achieving higher operational maturity (ingest, reconciliation, search and order, performance, error handling)**
  - **Global Change Master Directory (GCMD) portal to ECHO underway**
  - **ECHO 8.0 based on service-oriented architecture paradigm.**

- **New ROSES 2006/ACCESS ECHO client awards:**
  - **“AQUA: Automated Data Query & Access for Large Earth Science Datasets”, Brian Wilson, JPL**
  - **“A Water and Energy Cycle EOS Clearing House Client”, Paul Houser, Institute of Global Environment and Society, Inc.**

- **Current Holdings**
  - **Collections 2,237**
  - **Granules 56 million**
  - **Browse 14 million**

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NASA

Key Benefits of Proposed "Step 1" Plan

✓ Maximize Science Value

- Data access easier and data products quickly available to science community
- MODIS data more closely integrated with science community
- Potential pathfinder for migration of other data into science communities

✓ Substantial Cost Savings

- Addresses operational and sustaining engineering
- Takes advantage of current IT advances
- Investments provide return on value within 3 years

✓ Manageable Risk

- Minimizes software development efforts
- Builds upon existing systems
- Utilizes steps within plan as proof of value before proceeding
- Reduces footprint for EOSDIS Core System

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ECS/SDPS Evolution

Rearchitect ECS to simplify sustaining engineering and automate operations

Features:

- Simplify software architecture (eliminate 15 components & 750K SLOC)
- Move towards disk-based archive
- Leverage new hardware technology (e.g., commodity-based systems; shared storage) to reduce hardware maintenance costs

Benefits:

- Low risk approach based on proven data pool technology
- Increased system automation; simplified hardware/software configuration
- Reduction in operational costs at ECS DAACs
- Improved data access due to increased on-line storage and commodity disks/platforms
- Provides risk mitigation for GES DAAC and LaRC DAAC ECS phase out efforts

ECS Milestone Status

- ✓ Sybase to Linux Transition
- ✓ SAN Monitoring Tools
- ✓ DDTS Replacement (TestTrackPro)
- ✓ AMASS to StorNext
- ✓ DAAC Blade Centers
- ✓ Rimage Replacement (Luminex)
- ✓ Release 7.20 (Migration to commodity HW, Linux)
- ✓ SAN Capacity Upgrades
- ✓ COTS Upgrades
- ECHO WSDL Order Controller (EWOC)
- Release 7.20+ (BMGT Patch)
- Release 7.21 (Code simplification)

LP DAAC Integration & Simplification

- ✓ ASTER DAR Tool DAAC Unique Extension (DUE)
- ✓ Catalog Reconciliation Tool (CRT) DUE Re-design
- ✓ ECHO 9 Testing
- ✓ ASTER Expedited Flow (part of Goddard Evolution)
- ✓ ESDIS Metrics System (EMS) Migration (from EDGRS)
- Machine-to-Machine Gateway (MTMGW) DUE
- Traffic Cop DUE Re-Design
- S4PM-XML Processing Gateway DUE
- EDG to WIST Migration Testing
- ECHO 10 Testing
- Platform consolidation (Linux, commodity servers)
- Computer Room consolidation (reduce footprint)

Schedule

- **Week of August 27, 2007**
  - Formal retirement of ECS Java DAR Tool (replaced w/ LP DAAC DAR Tool)
- **Week of September 10, 2007**
  - ECS 7.20 Operational
  - Blade Center, Rimage Replacement, EMS Transition
- **September 25 & 26, 2007**
  - EMD / DAAC Technical Exchange Meeting
- **December, 2007**
  - MTMGW Change, Traffic Cop, EWOC
- **January, 2008**
  - ECHO 10.0 Operational, WIST replaces EDG
- **February 2008**
  - ECS 7.21+ (BMGT Patch) Delivery Review
- **March 2008**
  - ECS 7.21 Delivery Review

Post-ECS Evolution Considerations

- Current EOSDIS Maintenance & Development (EMD) support contract extended thru May 2009

- LP DAAC Silos reaching end of life
  - EMD looking at 3rd party vendors for support
  - Moving towards more and more data online

- Realization of Evolution Efficiencies
  - Reduced facilities expenses
  - Less frequent changes to Baseline
  - Increased automation & monitoring

Questions…