Land Processes DAAC Update
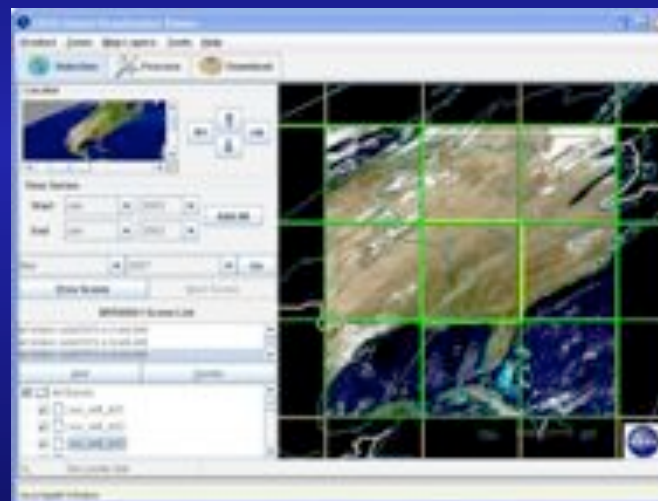
MODIS-VIIRS Science Team Meeting
January 26-28, 2010

Dave Meyer
LP DAAC Project Scientist

New capabilities since the last MST

- **Accomplishments**
    - **New Website**
    - **MRTWeb**
    - **Landsat Metadata in ECHO**
    - **ASTER Global DEM**
    - **New MODIS products**
    - **ECS On Line Archive (March 2010)**
    - **MEaSUREs**
- **User Survey & UWG recommendations**

USGS

NASA

New Web site: https://lpdaac.usgs.gov/
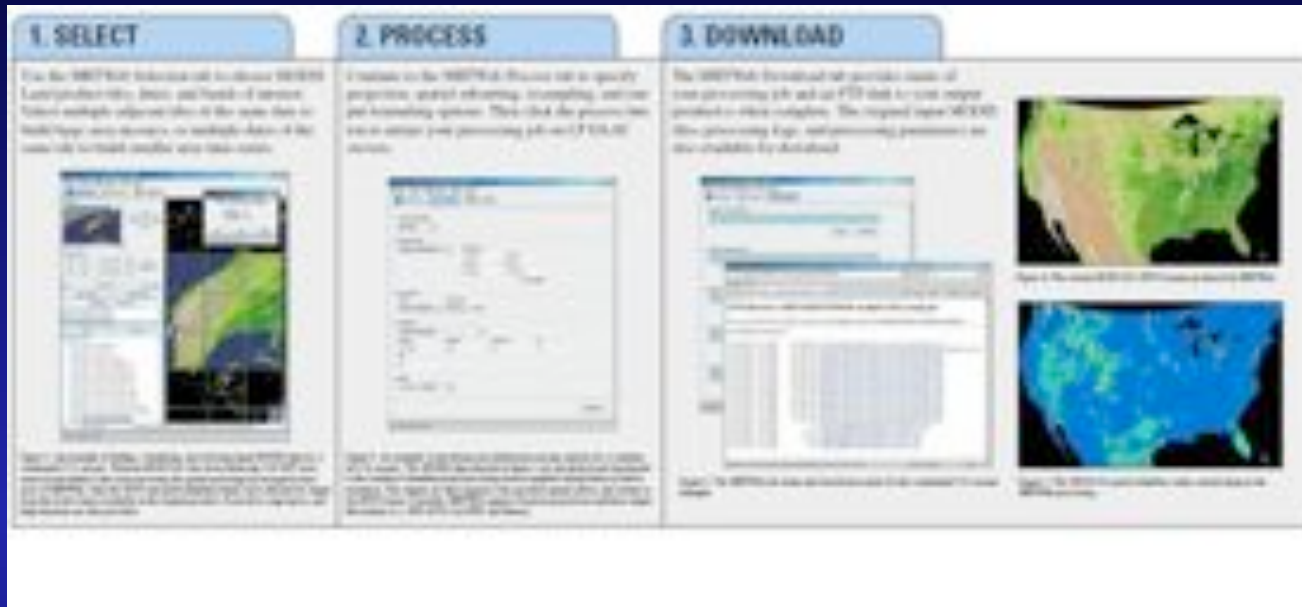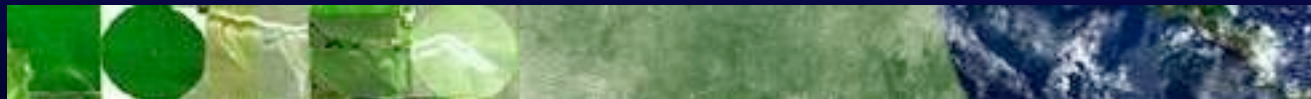
MRTWeb

- MRTWeb 2.0 released in February 2009
  - Reuse of MRT and GloVis
  - Enables users to easily and quickly select, mosaic, re-project, resample, reformat, and subset MODIS data.
  - Shares GloVis concept of "3 clicks to data"
- Statistics showing positive impact on network traffic
 - In June, nearly 9:1 ratio of input MODIS tiles to downloaded products
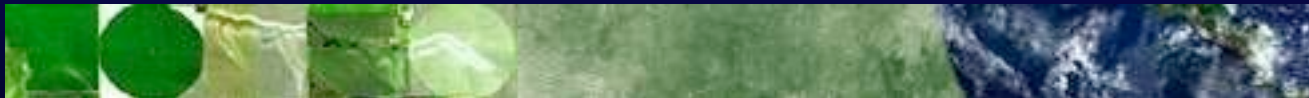
MRTWeb

Landsat Metadata in ECHO

- Entire Landsat archive made available to the public at no charge on January 9th, 2009

- LP DAAC provided capability to place Landsat browse and metadata in ECHO and enable those products to be ordered from a single ESDIS user interface (WIST).

  - Operational release in February 2009
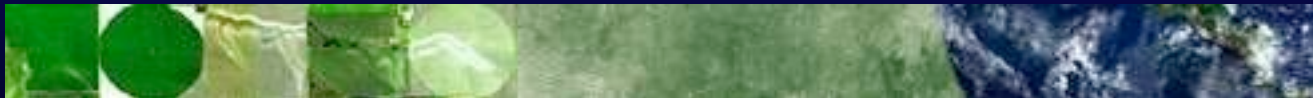
New MODIS Products

- MCD45A1 Burned Area product released October 2008

- V004.1 Land Surface Temperature and Emissivity products released January 2009

- MOD44W MODIS-SRTM 250 m Land-Water Mask product released August 2009

USGS

**NASA**

Online Archive

- Historical "data pool"
  - Currently, a subset of LP DAAC's data holdings are online in the DataPool
  - Distribution of data not already in DataPool needs to be staged from tape (slow, prone to tape/drive anomalies)
  - All new ingest is now being written to the On Line Archive

- Online Archive (March, 2010 release)
  - Increase DataPool storage (to ~1PB)
  - Primary copy of all LP DAAC data holdings will be on spinning disk (online) rather than on tape (near-line or offline)
  - Secondary (Backup) copy on LTO (Linear Tape Open)
    - In silo or shelf storage

- Challenge: How to best utilize this online archive to provide new services to the user community…

≋USGS

NASA

USGS/EROS Data To Users

- **Distributed over 1.2 Petabytes in FY2009**

FY 2009 LPDAAC, LANDSAT, OTHER SATELLITE, NON-SATELLITE and SEAMLESS DATA DISTRIBUTED
Monthly Distribution (left axis) and Cumulative Distribution (right axis)
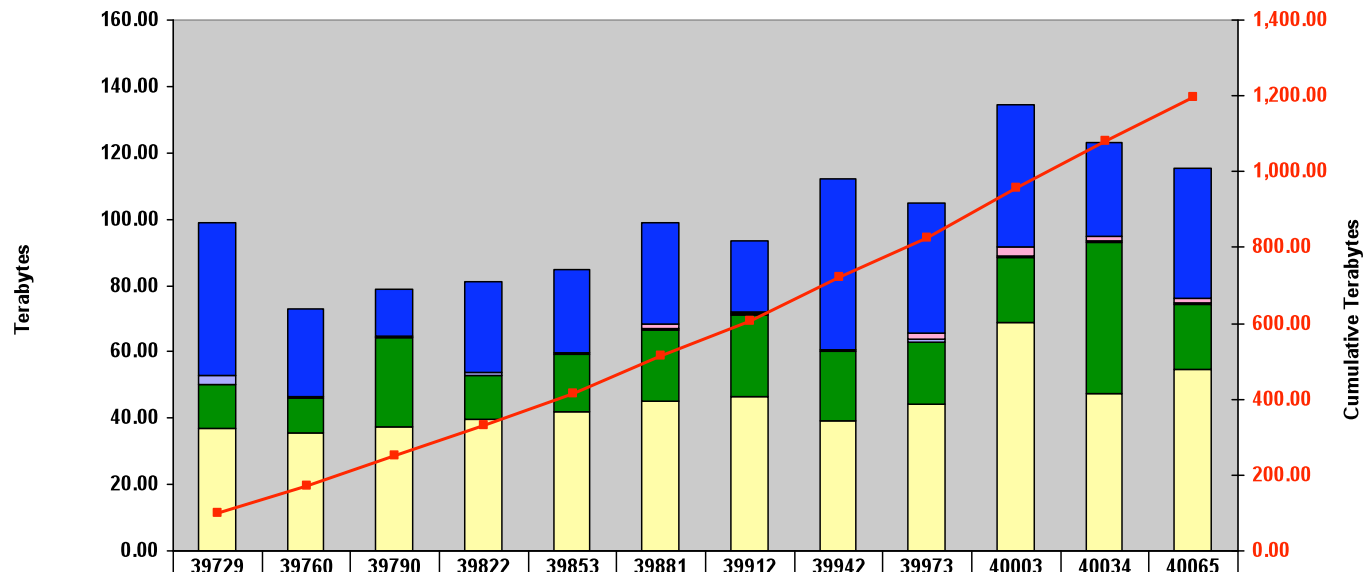
|	39729	39760	39790	39822	39853	39881	39912	39942	39973	40003	40034	40065
Seamless	45.92	26.15	14.33	27.18	25	30.43	21.41	51.11	39.23	42.87	28.29	39.21
Other Satellite	0.08	0.13	0.08	0.24	0.21	1.17	0.24	0.12	1.62	2.44	1.06	1.43
Non-Satellite	2.84	0.45	0.34	0.53	0.31	0.53	0.54	0.43	0.7	0.82	0.76	0.59
Landsat	13.08	10.2	26.99	13.5	17.15	21.39	24.47	20.86	19.13	19.31	45.7	19.68
LPDAAC	36.86	35.78	37.33	39.59	41.94	45.27	46.6	39.4	44	68.9	47.2	54.6
Cumulative Terabytes Distributed	98.78	171.49	250.56	331.6	416.21	515	608.26	720.18	824.86	959.2	1082.21	1197.72

The ASTER Global DEM
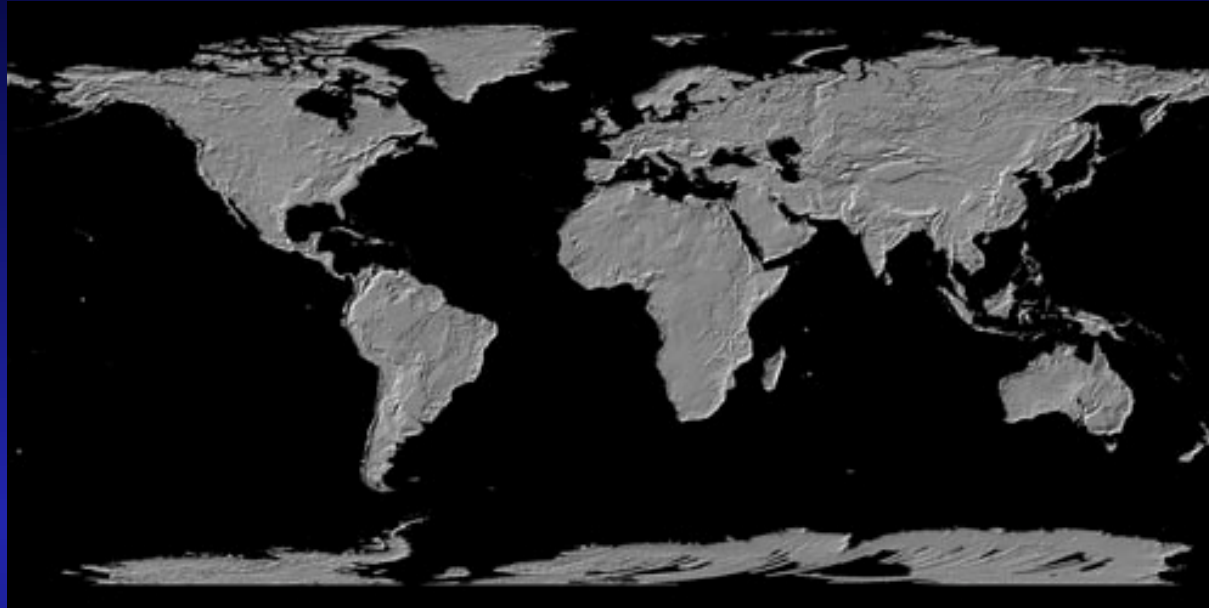
- **Released June 29, 2009**
- **Covers land surfaces between 83°N and 83°S**
- **1 arc-second grid cells in geographic lat/lon coordinates**
- **Referenced to the WGS84/EGM96 geoid**
- **Distributed in 22,600 1°-by-1° tiles**

  https://lpdaac.usgs.gov/lpdaac/products/aster_products_table/routine/
     global_digital_elevation_model/v1/astgtm
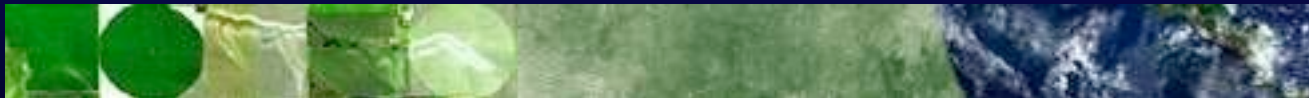
ASTER Global DEM

- Over 2 Million tiles downloaded in the first month

	Tiles	Orders
LPDAAC (as of 8/1)	1,536,353	22,279
ERSDAC (as of 7/25)	614,544	22,861
TOTAL	**2,150,897**	**45,140**

- High volume of website traffic during the initial release
- High volume of questions for User Services
- Utilized existing ESDIS infrastructure for distribution (ECHO use registration, WIST, EMS metrics)

ASTER Cloud Cover Metadata Update

- Archived ASTER cloud cover scores have been found inaccurate
  - More accurate information is available based upon MODIS MOD35 Cloud Mask
- ERSDAC plans to implement the MOD35 approach
- ASTER Science Team desires consistency at both product distribution points

Operations Concept

- Obtain new cloud values from GDS
  - One-time process for historical data
  - On-going FTP pull post ingest (1-2 weeks)
- Retain original cloud values in hdf files
- Update metadata and clients with new cloud values
- Include Data Pool rolling 1B in metadata updates
- Display only new values for client searches (if available)

≋USGS

NASA

MEaSUREs & the LP DAAC

PI First name	PI Last name	Institution	Title	Program Scientist	Comment
Kamel	Didan	University of Arizona	Vegetation Phenology and Enhanced Vegetation Index Products from Multiple Long Term Satellite Data Records	Wickland	Collaboration funded through MEaSUREs
David	Roy	South Dakota State University	Web-enabled consistent large area Landsat data streams and derived surface characterizations - a MODIS-Landsat data fusion for the terrestrial user community	Wickland	Collaboration funded through MEaSUREs (USGS Landsat Project)
John	Townshend	University of Maryland	Earth Science Data Records of Global Forest Cover Change	Gutman	Contacted
Michael	Kobrick	Jet Propulsion Laboratory	The Definitive Merged Global Digital Topographic Data Set	Labrecque	Contacted
Kyle	McDonald	Jet Propulsion Laboratory	An Inundated Wetlands Earth System Data Record: Global Monitoring of Wetland Extent and Dynamics	Wickland	Contacted (EOSDIS DAAC not assigned)

USGS   **NASA**

New Services- MEaSUREs VIP

- **Earth Science Data Record: <u>Vegetation Phenology and Vegetation Index</u> - Kamel Didan, University of Arizona (PI)**
- **Development 2008-2013, archived in ECS if approved by Data Systems Working Group**
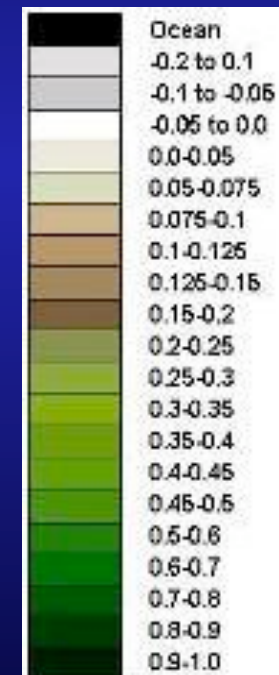
New Services – MEaSUREs VIP

- **Data Discovery System**

- **Visually-based interrogation (WCS, WMS)**

- **User Selection of**

    - **File Format, Map Projection, Subsetting (Band and Spatial), Temporal Range**

- **Immediate download from an online archive**

- **Groundwork for Decision Support System**

Gauging User Community Needs

LP DAAC Science & User Services

- The User Working Group (UWG - strategic planning)
- ASTER & MODIS Instrument Science Teams (strategic planning)
- Phone and email inquiries (issue resolution)
- Direct contact (conferences, workshops, etc.)
- Online survey (applications)

LP DAAC metrics

- Access & distribution patterns (user model)

EOSDIS customer satisfaction survey

- What are we doing well? What's missing?

≋USGS

2008 User Survey: Analysis

- **Improved use of new enabling technologies**
  - **Better integration (Landsat, other DAACs, etc.)**
  - **Wider range of geographic services (projections, datum, formats, etc.)**
  - **Adaptive processing based on user requirements**
  - **Product latency for near-real time applications**
  - **Better tools for time series development**
  - **Simple access with a visual interface**
    - Glovis interface preferred to WIST (visual)
   - WIST provides a more comprehensive access portal

2008 User Survey: Analysis

- **Product Documentation**
  - **Improved access to & organization of product descriptions and related services**
- **On-line training materials**
  - **Aligns with UWG recommendations**
  - **Tutorials vs. "webinars"**
- **Improved use of new enabling technologies**
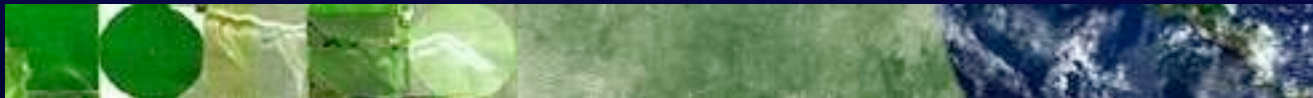 - **Web services**
  - **Integrated clients**

UWG Recommendations (2008)

UWG Recommendations (i – implemented, d – in development)	Strategic Themes			
	Integrated Observations	Access & Usability	Community Data & Products	Outreach & Education
Integrated DAAC Portal to Land Data Collections	X	X	X	X
Community Product Review (includes eMODIS) (d)			X	
On-line Archive (d)		X	X	
Multi-mission MRTWeb	X	X		
Application Training for Land Remote Sensing Data (d)	X	X	X	X
Inter-DAAC Access Tools & Links	X	X	X	X
Improved Product Turn-around (i)		X		
Improved LPDAAC Access Procedures & Tools		X		
COTS-Friendly Data Formats (i)	X	X	X	X
Increased Presence at Conference & Workshops (*)				X

≋USGS

NASA
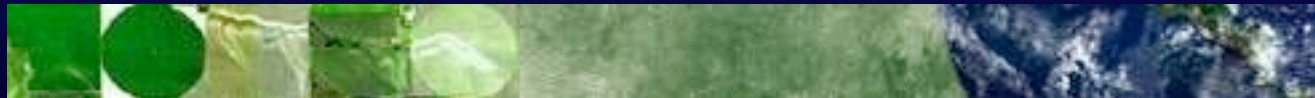
2009 Recommendation Topical Areas

- **New missions & data sets (advocacy & stewardship) – White Paper (K. Gallo)**
  - **Continuity missions (e.g., VIIRS, LDCM)**
  - **Decadal survey missions**
  - **Data sets of interest to LP DAAC community (e.g., ASTER GDEM)**
- **Products & Services for "societal benefit"**
  - **Awareness and access to LP DAAC holdings**
  - **Service to a growing number of "operational" users**
- **Packaged, applications-ready data sets**
  - **MODIS, ASTER, Landsat,**
  - **Collaboration with other DAACs**
- **Enhancements to products & services**
  - **To date: MRTWeb, On-line Archive,**
  - **Web services (including collaboration with other DAACs)**

Questions?