



**Committee on Earth Observing Satellites  
Land Product Validation subgroup**

**MODIS Science Team meeting  
14 July 2004**

**Jeff Morisette**

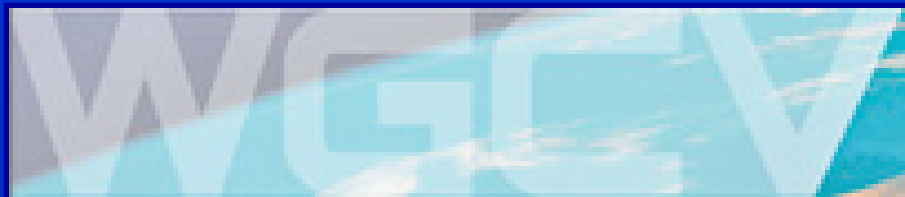
**jeff.morisette@nasa.gov, (301) 614-6676**

# CEOS/WGCV/LPV Organizational Structure



## CEOS

*Committee on Earth Observing Satellites*  
(NASA rep = Ghassem Asrar)



## WGCV

*Working Group on Cal/Val*  
(NASA rep = Jim Dodge  
Current Chair Steve Ungar/Goddard)



## LPV

*Land Product Validation Subgroup*  
(NASA rep & current chair =  
Jeff Morisette)

# Committee on Earth Observing Satellites

**GOAL:** ensure that critical scientific questions relating to Earth observation and global change are covered and that satellite **missions do not unnecessarily overlap each other.**

## **PRIMARY OBJECTIVES:**

- 1:** to optimize benefits of spaceborne Earth observations through **cooperation** of its participants in mission planning and in development of compatible data products, formats, services, applications, and policies
- 2:** to serve as a focal point for international **coordination** of space-related Earth observation activities; and
- 3:** to exchange policy and technical information to encourage **complementarity and compatibility** of observation and data exchange systems.

<http://www.ceos.org/>



# CEOS



- comprising 41 space agencies and other national and international organizations
- created in 1984
- recognized as the major international forum for the coordination of Earth observation satellite programs and for interaction of these programs with users of satellite data worldwide

Individual participating agencies make their **best efforts** to implement CEOS recommendations

...**“recommendations”** often come from the **CEOS Working Groups**.

# **CEOS Organization**



**Working Group on Information Systems & Services (WGISS)**

**Working Group on Calibration and Validation (WGCV)**

**Education and Training (WG-Edu)**

**Strategic Implementation Team (SIT)**

**Ad Hoc Team on Utilization**

**Ad Hoc Working Group on Earth Observation**

**Ad Hoc Group on Earth Observations (GEO)**

# Working Group on Cal/Val

**GOAL:** ensure long-term confidence in the accuracy and quality of Earth observation data and products.

## **SPECIFIC TASKS:**

- 1. sensor-specific calibration and validation**
  - 2. geophysical parameter and derived product validation.**
- **a forum for calibration and validation information exchange, coordination, and cooperative activities**
  - **promotes the international exchange of technical information and documentation, joint experiments, and the sharing of facilities, expertise, and resources.**

**WGCV also seeks to be the recognized first point of contact for the international user-community as far as calibration and validation is concerned.**

**With the advent of the Integrated Global Observing Strategy (IGOS), the WGCV has devoted **increased attention to the validation of higher-level products.****



# WGCV Organization



- **Atmospheric Chemistry Subgroup**
- **Infrared and Visible Optical Sensors (IVOS) Subgroup**
- **Land Product Validation (LPV) Subgroup** ←
- **Microwave Sensors (MS) Subgroup**
- **Synthetic Aperture Radar (SAR) Subgroup**
- **Terrain Mapping (TM) Subgroup**

<http://www.wgcvceos.org/> -

The goals and activities of WGCV are summarized in its Three-Year Work Plan.  
Current chair: Steve Ungar, NASA GSFC



# Land Product Validation subgroup

- **Established in 2000**
- **A topic-specific (non-wavelength-specific) subgroup**



## **Initial focus**

**(matching GOFD/GOLD implementation teams):**

- **Land cover/land cover change**
- **Biophysical parameters (starting with LAI)**
- **Fire and burn scar**



# Big Picture



## LPV provides a validation service to the Integrated Global Observation Strategy (IGOS)

- Global Terrestrial Observation System
  - Terrestrial Observation Panel for Climate (TOPC)
  - Global Observation of Forest Cover/Land Dynamics
- Global Carbon Observing System

## Implications:

- Focus Products: Biophysical, Land Cover, Fire Disturbance, & Albedo
- Working in conjunction with GOFC/GOLD's regional networks
- Opportunity/Need to integrate with TEMS, GT-Net, & UN's GLC-net

# CEOS WGCV Definition



## Validation:

*the process of assessing by independent means the quality of the data products derived from the system outputs*


(LPV will operate under this definition, but also with the understanding that validation activities should consider user accuracy needs and feedback to algorithm improvements.)

# Mission Statement & Goals




- to foster quantitative validation of **higher level global land products** derived from remote sensing data and relay results so they are relevant to users
- to increase the **quality and economy of global satellite product validation via developing** and promoting international standards and protocols for field sampling, scaling, error budgeting, data exchange for global land product validation
- to **advocate mission-long** validation and intercomparison programs for current and future earth observing satellites.

# LPV Plans (2003-2005)



- **Create infrastructure for validation data exchange and management (with WGISS) resulting in on-line access to CEOS Land Validation Core Site data sets (pilot for 5 sites exists) – modeled after EOS Land Validation Core Sites**
- **Conduct product Inter-comparisons**
- **Develop consensus “best practice” protocols for data collection and description**
- **Enhance web based information:**
  - **Establish individual listserv groups for: biophysical, land cover, fire (done in 2003)**
  - **Continue working with users to define uncertainty objectives/needs (by integrating with the CEOS/WMO database)**

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# WGCV/WGISS test facility

EROS Data Center, Sioux Falls, SD - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media History Mail Print Edit


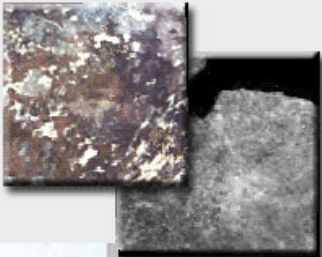
Address <http://edcscgs16.cr.usgs.gov/wgiss/> Go Links >>

**USGS**  
EROS Data Center - WGISS & WGCV Test Sites

**CEOS**

## CEOS Working Group on Information Systems and Services Test Facility for the Working Group on Calibration and Validation -- Land Product Validation Test Sites

This prototype is being developed in partnership between the Working Group on Calibration and Validation (WGCV <http://wgcv.ceos.org>) and the Working Group on Information Systems and Services (WGISS <http://wgiss.ceos.org>) and provides a good opportunity to demonstrate and improve upon the suite of WGISS tools and services that can be applied to assist with land product validation activities. This prototype is only one example of what can be done through CEOS collaboration efforts."

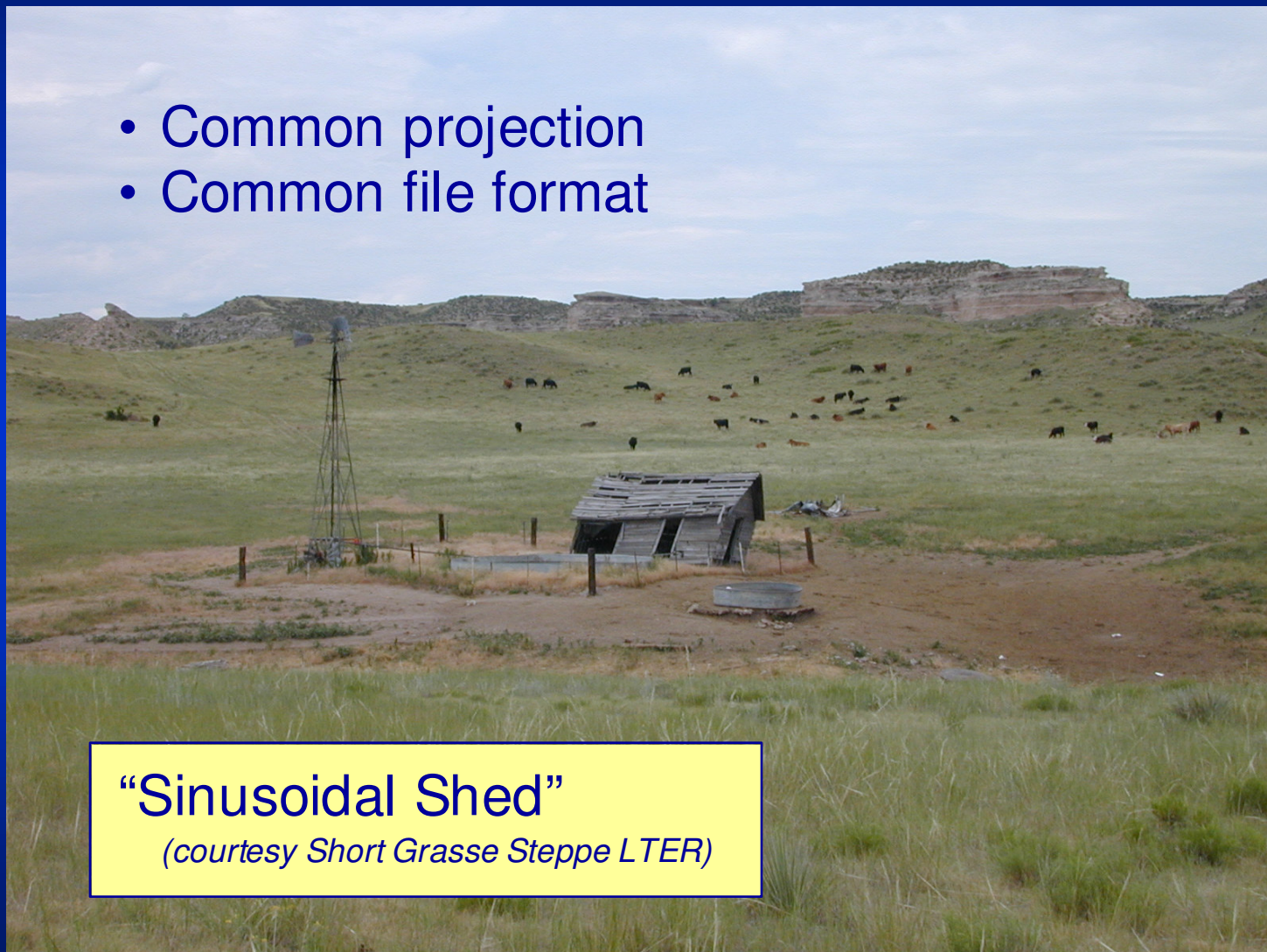


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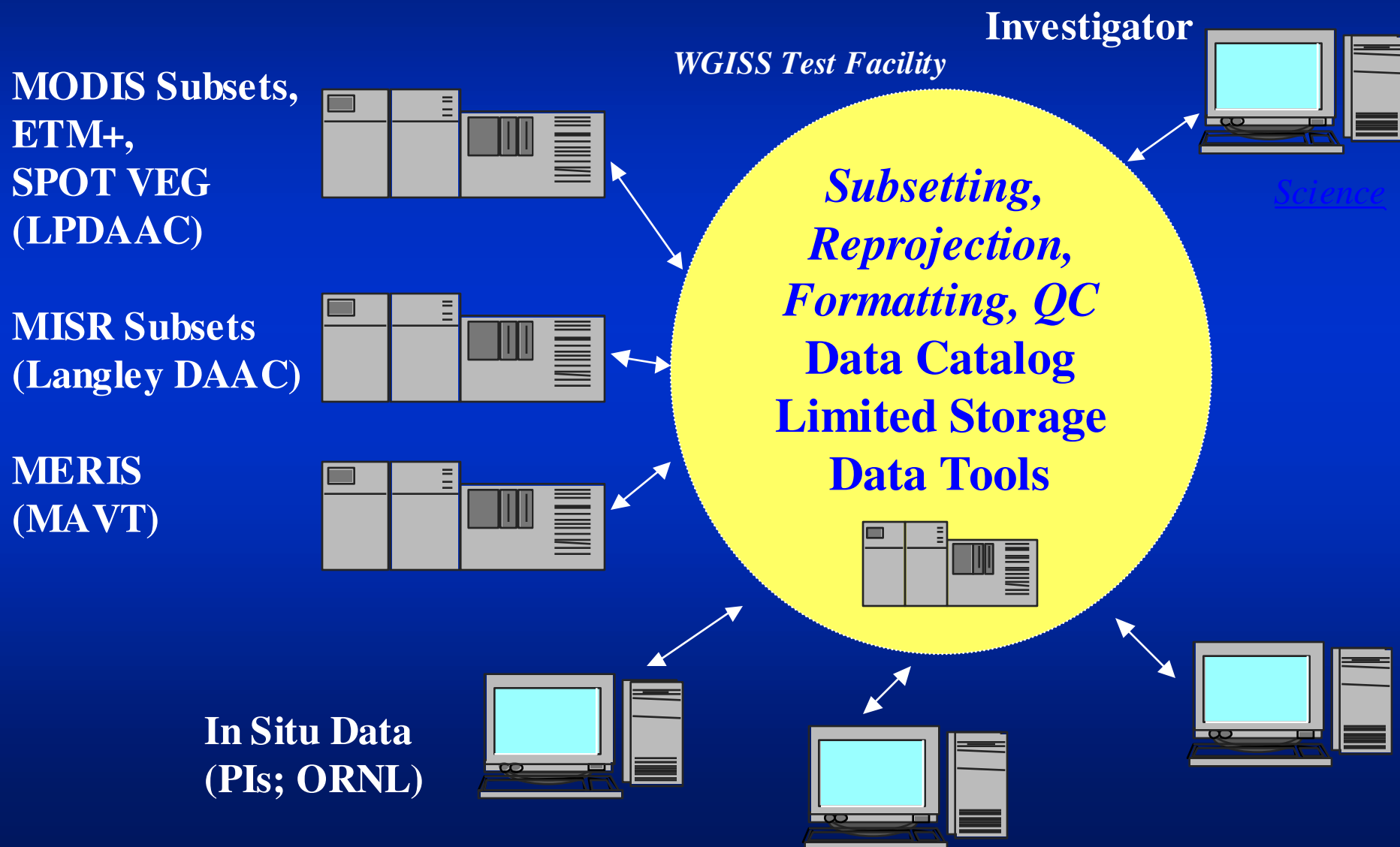
- Common projection
- Common file format




“Sinusoidal Shed”

*(courtesy Short Grasse Steppe LTER)*

# CEOS Core Test Sites: Data Distribution



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# “Intercomparison” General Timeline

LAI

Albedo

Fire related

Land cover

Topical meeting  
to establish data  
requirements

Boston U, 1998

Boston U, 2002

Lisbon, 2001  
Darmstadt 2004

Toulouse, 2001  
UMd, fall 2004

Decide on Sites

Develop data  
sharing  
infrastructure

Frascati, Italy  
2001

Avignon  
2005

Boston U, Feb '02  
(special issue)


Field Campaigns  
& individual  
product analysis

Synthesis of  
results

Montana  
August 2004



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# LPV “Special Issue”



- Special Issue: describing the state of the art research on both protocol and results for validation and accuracy assessment of global land products (Liang, Baret and Morisette, eds.)
- Three sections:
  - Surface Radiation variables
  - Ecosystem variables
  - Land cover characteristics (including land cover change, fire, and burnt area)
- Solicit a summary from User/GCM community to write a note for each section on the implication for the uncertainty/validation of the products



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# Five listservs established



`ceos_lpv_gen@listserv.gsfc.nasa.gov`

General information regarding LPV activity, both scientific and administrative

`ceos_lpv_rad@listserv.gsfc.nasa.gov`

surface RADiation products, including surface reflectance/atmospheric correction, land surface temperature, albedo and BRDF

`ceos_lpv_bio@listserv.gsfc.nasa.gov`

BIophysical parameters, including vegetation indices, leaf area index, FPAR, and vegetation productivity

`ceos_lpv_lc@listserv.gsfc.nasa.gov`

Land Cover and land cover change products

`ceos_lpv_fire@listserv.gsfc.nasa.gov`

FIRE, burn scar, and fire emissions products

*(related to action WGCV 20-11)*

# http:landval.gsfc.nasa.gov/LPVS

Welcome to the Land Product Validation Subgroup - Microsoft Internet Explorer

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**CEOS** WORKING GROUP ON CALIBRATION & VALIDATION  
Committee on Earth Observing Satellites  
**Land Product Validation Subgroup**

Home Landcover Biophysical Fire/Burn Surface Rad

**Subscribe!**  
LPV subgroup topical mailing lists:  
Subscribe: [v]  
Unsubscribe: [v]  
List: [v]

**Announcing...**  
Call for papers: [v] for LPV special issue in IEEE Transactions on Geoscience and Remote Sensing.

**Organization:**  
LPV is a subgroup of the Working Group on Calibration and Validation.

**WGCV**  
Working Group of the Observing Satellites

2004 calendar [v]

**Mission**  
To foster quantitative of higher-level global products derived from sensing data and so they are relevant

**Background**  
The subgroup on Land Product Validation (LPV) is one of six subgroups of the Working Group on Calibration and Validation (WGCV), which itself is one of two standing groups within the Committee on Earth Observing Satellites (CEOS, see also CEOS structure [v]). The six WGCV subgroups are:

- Infrared and Visible Optical Sensors (IVOS)
- Atmospheric Chemistry (AC)
- Microwave Sensors (MS)
- Synthetic Aperture Radar (SAR)
- Terrain Mapping (TM)
- Land Product Validation (LPV)

The Land Product Validation subgroup arose out of the recognition in the late nineties that standardized approaches to global product validation were essential for wide acceptance and use of proposed global land products. Several programs at the time were a global monitoring of Earth processes, many with plans to distribute higher level products. A common approach to validation would encourage widespread use of data, and thus help us to move toward standardized approaches to global product validation. With the high cost of in-situ data collection, the potential benefits from international cooperation are considerable and obvious. Previous requests for assistance from the original International Global Observing (IGOS) pilot projects and two subsequent ad hoc meetings of the WGCV identified need for improved international collaboration concerning the validation of land products derived from Earth observing satellites. A new subgroup within the WGCV was proposed at the CEOS Plenary in Stockholm at the end of 1999, receiving full support. The LPV was officially adopted as a subgroup at the WGCV-17 meeting in October of 2000. The LPV subgroup activities are divided up into four themes that complement the agenda of the Global Observations of Forest and Land Cover Dynamics (GOFCLD) program, namely biophysical products, fire/burn scar detection, and land cover dynamics. In addition to the GOFCLD themes, the LPV subgroup includes an Albedo/Surface Radiation thematic group. Working with GOFCLD, who seek the common goal of coordinated validation of fire products by standardized protocols, LPV aims for global coordination for all land products.

Pull-down menu for main topical areas:

- Land cover
- Biophysical
- Fire/Burn
- Surface Radiation

Each pull-down lists:

- Background
- Producers \*
- Meetings
- Case studies
- Inter-comparisons

\* producers page will link to accuracy statements for each product, where MODLAND accuracy statements are serving as an example to the international community

Quick links to:

- Listserves
- Announcements
- WGCV
- CEOS and
- CEOS calendar

web curator: Jaime Nickeson