



# CEOS Land Surface Imaging (LSI) Constellation

Dennis G. Dye  
USGS Southwest Geographic Science Center  
Flagstaff, Arizona, USA

G. Bryan Bailey  
Co-Chair, LSI Constellation Study Team  
& USGS Earth Resources Observation and Science Center (EROS),  
Sioux Falls, South Dakota, USA



# Background

- 19<sup>th</sup> CEOS Plenary (2005) concluded that the “CEOSS Implementation Plan for Space-Based Observations for GEOSS” should:
  1. Identify the supply of space-observations required to satisfy requirements expressed by GEOSS 10-year Implementation Plan
  2. Propose *an innovative process* whereby the Earth observing programs of CEOS member agencies might contribute to the supply of required observations
- **CEOS Constellations Concept** emerged as that “innovative process”



# CEOS Constellation Concept

- A CEOS Constellation is a **set of space and ground segment capabilities operating in a coordinated manner to meet common Earth observation requirements**
- Intended to **encouraging/facilitate cooperation among CEOS member agencies in operation of current land remote sensing satellite systems and planning for future system**, *without eroding the independence of individual agencies.*
- GEOSS will benefit as Constellations help agencies avoid duplication, close information gaps, and promote continuity in observations





# CEOS Constellations

- CEOS proposed 4 initial prototype constellations, currently in the implementation phase.
  - Ocean Surface Topography
  - Precipitation
  - Atmospheric Chemistry
  - **Land Surface Imaging (LSI)**
- Two new constellations were initiated last year
  - Ocean Color Radiometry
  - Ocean Surface Vector Wind





# Land Surface Imaging (LSI) Constellation Overview

## Goals and Objectives

- “...promote the efficient, effective, and comprehensive collection, distribution and application of space-acquired image data of the **global land surface**, especially to meet societal needs of the global population, such as those addressed by the GEO societal benefit areas”
- Define the optimal observational capabilities (and policies) to guide planning/development/operation of future LSI systems



## LSI Constellation Overview, cont.

- Represented by CEOS agencies that operate LSI satellite systems, as well as land remote sensing user community
- Activities of LSI Constellation conducted under direction of **LSI Constellation Study Team**





# LSI Constellation Study Team (April 2009)

## CEOS Agency Members

- USGS: **Co-Chair**, G. Bryan Bailey  
*(Tom Holm from July, 2009)*
- ISRO: **Co-Chair**, V. Jayaraman
- EC: Herve JeanJean
- INPE: João Viane Soares
- ESA: Michael Berger
- CSA: Daniel DeLisle
- CONAE: Ana Medico
- JAXA: Takeo Tadono
- NOAA: Kevin Gallo
- NASA: Garek Gutman
- NRSCC: Yonghong Zhang
- CRESDA: Xiaohua Yi
- GISTDA: Phuriwaj Ruengnaowaroj
- CNES: Aurelie Sand
- CDTI: Mónica Lopez

## CEOS WG Members

- WGCV (NASA) Stephen Ungar
- WGCV (USGS) Greg Stensaas

## User Community Members

- USGS: Brad Reed
- JRC: Alan Belward
- JPL: Mike Abrams
- Nagoya U.: Yasushi Yamaguchi
- BGS: Stuart Marsh
- U. Maryland: J. Townshend
- CSIRO: Alex Held



## Recent Accomplishments, Ongoing Activities and Future Plans

- LSI Constellation Portal “for Mid-Resolution Optical LSI Satellite System Information and Enhanced Data Access” now online at <http://wgiss.ceos.org/lcip>
- LSI Portal will be enhanced in cooperation with CEOS Working Group on Information Systems and Services (WGISS)
  - Additional LSI satellite system data types
  - increased functionality
- INPE will complete development of web-based services and/or freeware to:
  - convert various image formats to GeoTIFF
  - generate orthorectified images from Level 1 mid-resolution satellite data

## **Recent Accomplishments, Ongoing Activities and Future Plans, cont.**

- >125 scenes of mid-resolution, optical satellite data were contributed by CEOS member agencies to the FRA 2010 project
- Working Group on Regional Data Set Compilation (WGRDSC) currently working to assemble initial data sets for GLS 2010
  - Regional areas in S. America, Africa, and SE Asia have been defined

## **Recent Accomplishments, Ongoing Activities and Future Plans, cont.**

- **Working Group on Radar (WGR) is**
  - facilitating application of CEOS agency radar data to *GEO task on Forest Carbon Tracking*
  - promoting operational polarimetric SAR systems
- Final draft report on “Definition of standards for future mid-resolution, optical satellites” scheduled for completion by Sept. 2009 by CEOS System Engineering Office (SEO)



# LSI Constellation Portal



<http://wgiss.ceos.org/lsip>





# LSI Constellation Portal

**CEOS Land Surface Imaging Constellation Portal**  
for  
*Mid-Resolution Optical LSI Satellite System Information and Enhanced Data Access*

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**Overview**

- CEOS Agency Mid-Resolution Optical Satellite Systems

**Satellites**

- Satellites & Sensors
- Status & Launches
- Orbit Information

**Sensors**

- Band Information
- Visible & NIR Bands
  - SWIR Bands
  - Thermal Bands
- Panchromatic Bands
- Hyperspectral Bands
  - Radiometric & Geometric Characteristics
  - Geographic Characteristics

**Data**

- Data Access
- Documentation

**CEOS Agency Current and Former Mid-Resolution Optical Satellites & Sensors**

Satellite	Sensors	Agencies
ADEOS-1	AVNIR-1	JAXA
ALOS	AVNIR-2	JAXA
CBERS-1	HRCC, IRMSS	CAST, INPE
CBERS-2	HRCC, IRMSS	CAST, INPE
CBERS-2B	HRCC	CAST, INPE
EO-1	ALI, Hyperion	NASA, USGS
IMS-1	MX-T	ISRO
IRS-1A	LISS-I, LISS-II	ISRO
IRS-1B	LISS-I, LISS-II	ISRO
IRS-1C	LISS-III A	ISRO
IRS-1D	LISS-III A	ISRO
IRS-P2	LISS-III A	ISRO
IRS-P6	LISS-III B, AWiFS	ISRO
JERS-1	OPS	JAXA
Landsat 1	MSS	NASA, USGS
Landsat 2	MSS	NASA, USGS
Landsat 3	MSS-B	NASA, USGS
Landsat 4	MSS, TM	NASA, USGS
Landsat 5	MSS, TM	NASA, USGS
Landsat 7	ETM+	NASA, USGS
SAC-C	HRTC	CONAE
SPOT-1	HRV	CNES
SPOT-2	HRV	CNES
SPOT-3	HRV	CNES
SPOT-4	HRVIR	CNES
SPOT-5	HRG	CNES
Terra	ASTER	METI, NASA
THEOS	MS	GISTDA



<http://wgiss.ceos.org/lcip>





# Regional Data Set Compilation Areas for GLS 2010



