

# **CEOS Land Surface Imaging (LSI) Constellation**

## **Overview, Accomplishments, Activities, and Plans**

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LSI Constellation Study Team

## Brief Overview

- Activities of the LSI Constellation are conducted under the direction of the LSI Constellation Study Team.
  - Established in late 2006.
  - Members represent nearly all CEOS agencies that operate LSI satellite systems, as well as the land remote sensing user community.
  - Certain activities are led by Working Groups of the Study Team.
- Last year, LSI Constellation activities included work on unfinished tasks from 2007 and two new major undertakings.
  - Ongoing tasks focused on increasing the cooperation of CEOS agencies in the operation of their existing mid-resolution, optical satellite systems.
  - A new radar focus area was initiated, led by the Working Group on Radar.
  - A second working group, the Working Group on Regional Data Set Compilation, was established to compile regional sets of mid-resolution data as initial contributions to Global Land Survey 2010 (GLS2010).

## Recent Accomplishments and Activities

- Toward Completing Unfinished Tasks.
  - More than 125 scenes of mid-resolution, optical satellite data were contributed to the FRA2010 Project by CEOS member agencies.
  - A prototype *LSI Constellation Portal for Mid-Resolution Optical LSI Satellite System Information and Enhanced Data Access* was developed in cooperation with CEOS WGISS, and demo'd at GEO V in Bucharest.
  - The SEO is working to complete definition of standards (guidelines) for future mid-resolution, optical LSI satellite systems.
  - INPE is leading an effort to develop and provide web-based services and/or freeware to -
    - Convert input images in various formats to images in GeoTIFF.
    - Generate orthorectified images from Level 1 mid-resolution satellite data.
- The WGRDSC currently is working to assemble initial data sets.
  - Regional areas in South America, Africa, and SE Asia have been defined.
  - Most agencies responded positively to the WGRDSC solicitation of interest in contributing data, and follow-up discussions are beginning.

## Future Plans

- The 2009 LSI Constellation Work Plan focuses on completing and sustaining current and ongoing activities.
  - *LSI Constellation Portal for Mid-Resolution Optical LSI Satellite System Information and Enhanced Data Access* will be **released April 4.**
  - In cooperation with WGISS, the LSI Portal will be enhanced to include other LSI satellite system data, as well as increased functionality. **(Specifics discussed at WGISS meeting last week....I have not heard outcome yet, and it still needs to be discussed with LSI Constellation Study Team, but the WGISS discussion is a start toward Portal enhancement.)**
  - Definition of standards for future mid-resolution, optical satellite systems is scheduled for completion of a draft final report in September.
  - The WGR likely will focus on facilitating application of CEOS agency radar data to the GEO task on Forest Carbon Tracking and on promotion of operational polarimetric SAR systems. **(I have been encouraging FCT folks to establish their radar efforts under the umbrella of the LSI Constellation Working Group on Radar, however, they seem reluctant to do so, thus far.)**
  - INPE will complete development of the web-based services or freeware.
  - The WGRDSC will continue to compile regional data sets and plan for its contributions to GLS2010.
- The Work Plan may include new tasks, if proposed with support.

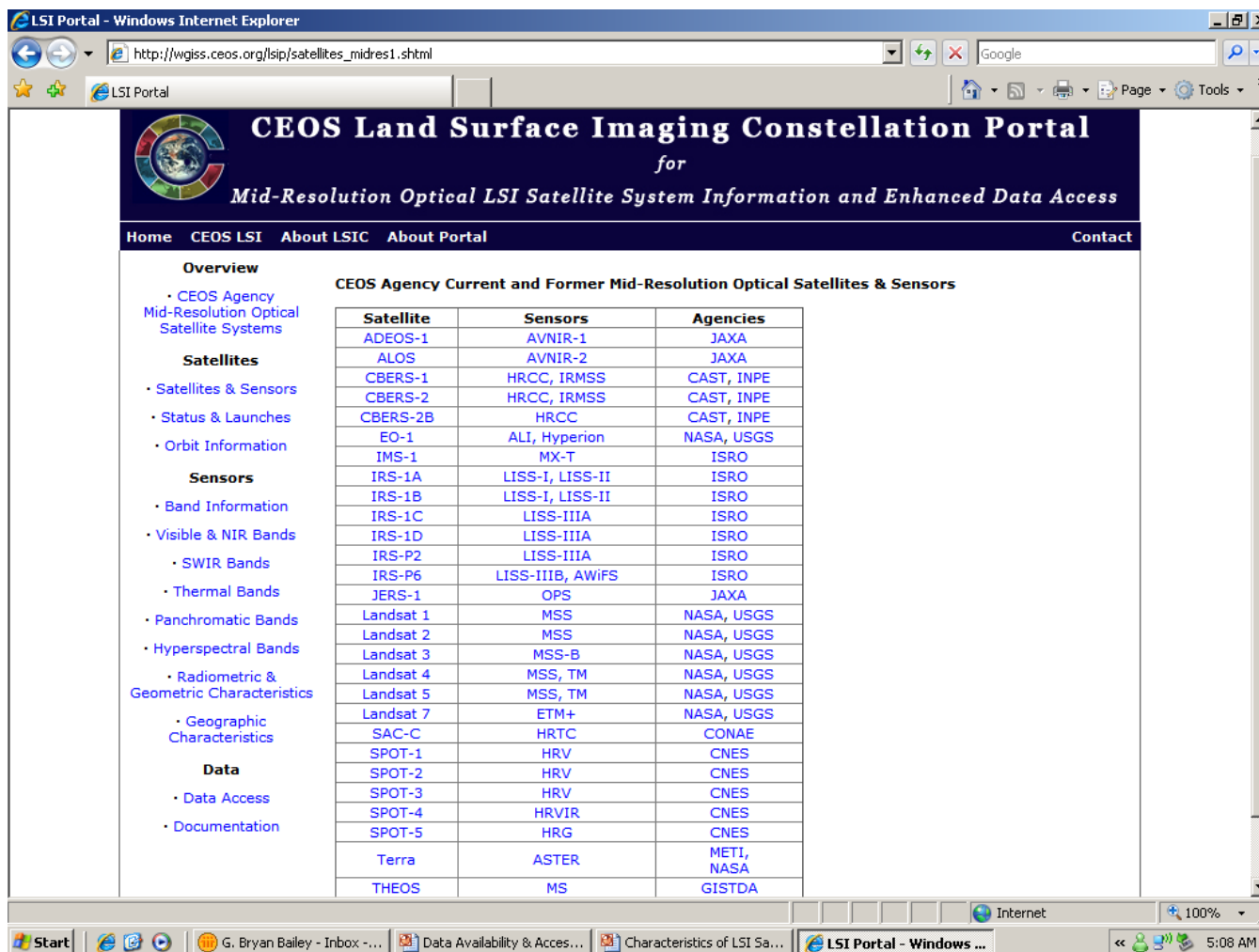
## Summary of 2009 Work Plan Deliverables

- Initial release of the *LSI Constellation Portal for Mid-Resolution, Optical Satellite System Information and Enhanced Data Access*.
- **Tools** for data format conversion and orthorectified image generation.
- Draft **report defining standards** for future mid-resolution, optical satellite systems.
- **Implementation plan** for regional data set compilation activities.
- **Arrangements with CEOS agencies** to acquire and provide data needed for the regional data set compilations.
- **Data** provided to the regional data set compilation effort.
- Active and functioning **Working Group on Radar**.
- An **implementation plan** for the radar goal or **separate work plans** for activities undertaken by the WGR.

# Prototype LSI Constellation Portal



# Prototype 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**
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  - 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



# Regional Data Set Compilation Areas





## Parting Thoughts

- During the past two years, the LSI Constellation has realized some important accomplishments, but much more remains to be achieved.
  - Greater cooperation among CEOS agencies in the operation of their existing systems is possible and needed to expand and enhance the use of land remotely sensed data to the benefit of our global society.
  - Optimal “standards” (guidelines) for future LSI satellite systems need to be determined by the agencies, ***and their user communities***, to ensure that the best possible data are available in the years ahead to address the many compelling problems that will continue to face us far into the future.
- Participation and support from the CEOS agencies with land surface imaging interests, as well as from members of their user communities, will be critical to achieving LSI Constellation goals for 2009 and beyond.