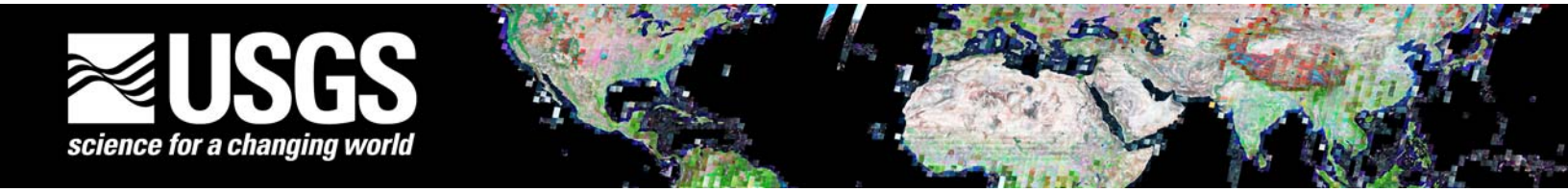


Landsat Updates - Volume 1, Issue 1, 2007

Landsat Science Team Meeting held January 9-11, 2007

Members of the newly-formed Landsat Science Team held their inaugural meeting at the U.S. Geological Survey (USGS) Center for Earth Resources Observation and Science (EROS) on January 9-11, 2007.

USGS project scientist Tom Loveland and NASA project scientist Jim Irons led the meeting. Their responsibilities will include facilitating the functions of the team and setting the team's agenda and priorities. Dr. Curtis Woodcock of Boston University was elected to serve as the Team Leader. His responsibilities include serving as the lead representative of the Landsat Science Team, acting as a spokesperson for the team, and communicating team needs to the USGS and NASA.

Also established were four working groups that will each work with USGS and NASA staff to address a set of Landsat program and LDCM mission topics:

- Operations Acquisition strategy – GMAP, International Cooperators, Off-Nadir Acquisition Issues (led by Darrel Williams, NASA)
- Products – Archive Data, Data Gap and Mid-Decadal Studies, Quality Assurance and Validation, User Models, Application Development, Data and Measurement Continuity, (led by John Dwyer, SAIC/USGS; Jeff Masek, NASA)
- Future Missions, Outreach, and Advocacy – Long-term Observation Needs, International Cooperation, Thermal Band (led by Sam Goward, University of Maryland)
- Instrument Engineering – Calibration, Observation Technologies, Surface Reflectance, Atmospheric Corrections, Thermal Infrared Imaging (led by Dennis Helder, South Dakota State University)

Specific topics were identified for study prior to the next meeting. These topics are related to mission operations, the future of land imaging, the USGS Landsat data distribution, data gap mitigation implementation, and international cooperator historical holdings.

In addition, a letter advocating an LDCM thermal infrared imaging sensor was drafted by the team, to be sent to key officials in NASA, USGS, and other organizations.

The inaugural meeting ended by planning future meetings, which will be semi-annual. Meeting location will tentatively rotate among USGS, NASA, and Science Team member facilities. The next meeting will be held during the summer of 2007 in Corvallis, Oregon and will be hosted by Warren Cohen of the Forest Service.

U.S. Department of the Interior
U.S. Geological Survey

Landsat in Everyday Places

In 2006, Landsat scenes could be sighted in books, magazines, on TV, and in the movies. One of our most visible locations is in the Smithsonian National Air and Space Museum, where Landsat scenes make up part of a traveling exhibit entitled “Earth from Space.”

In 2007, a pair of Landsat scenes was published in National Geographic Magazine in a February, 2007 story on mangrove forests (http://www7.nationalgeographic.com/ngm/0702/feature5/index.html). The Landsat scenes showed the impact of aquaculture on this increasingly threatened ecosystem on the west coast of Honduras, and were adapted from “One Planet, Many People: Atlas of Our changing Environment,” published by the United Nations Environment Programme in 2005. A detailed description can be found in Chapter 3.2 on pages 98-99 of the atlas (http://na.unep.net/OnePlanetManyPeople/chapters.html).

USGS Acquisition Strategy for Ground System Segments

The National Aeronautics and Space Administration (NASA) and the Department of the Interior's U.S. Geological Survey (USGS) share responsibility for the Landsat Data Continuity Mission (LDCM). NASA will procure and/or develop the satellite and instrument, provide launch services, and perform on-orbit satellite checkout. The USGS will develop and implement the ground station network, including archive and image processing facilities, and will conduct satellite operations, data archiving, and product dissemination. In addition, the USGS will be responsible for satellite flight operations. View the entire document

LDCM Operational Land Imager (OLI) Proposals in Review

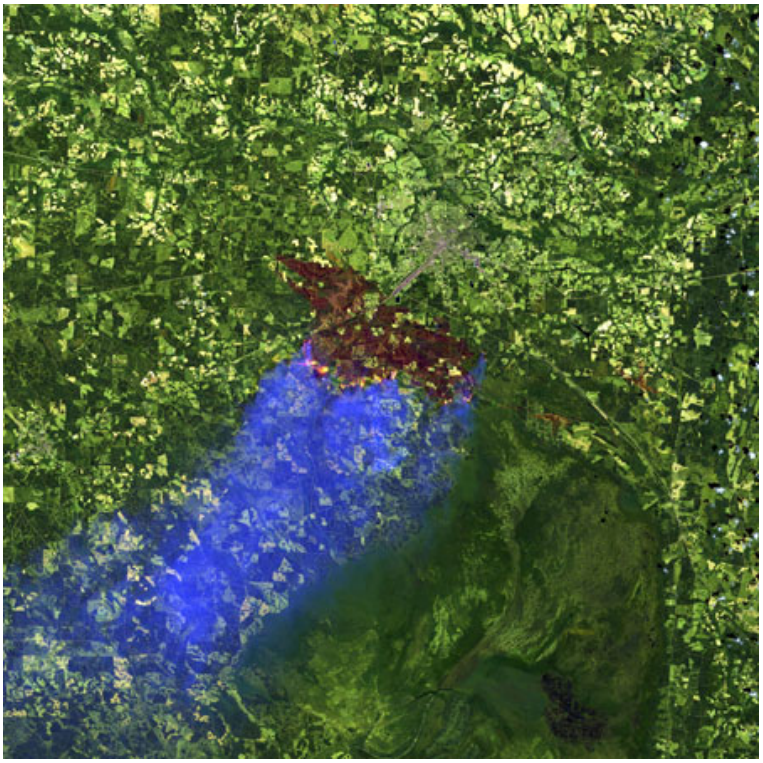
The LDCM Operational Land Imager (OLI) Requests for Proposals (RFP) were received by February 23, 2007. Proposals are currently being reviewed. NASA plans to award the contract in early summer 2007.

Image Spotlight

"Georgia Fires"

http://landsat.usgs.gov/gallery/detail/449/

The Georgia Fires consists of two fires, the Sweat Farm Road fire and the Big Turnaround fire. The fires are located 10 miles west of Waycross, Georgia and are separated by Swamp Road. The Sweat Farm fire began on April 16, 2007, and has burned more than 87 square miles of forest and swampland in southeast Georgia. Eighteen homes were destroyed, and close to 1,000 people near Waycross, Georgia were forced to evacuate. The Sweat Farm Road fire was cause by a downed power line that ignited trees near Okefenokee National Wildlife Refuge. The Big Turnaround fire has consumed over 26,000 acres but no structures have been lost. Smoke from the fires has drifted as far south as St. Augustine, Florida and the Gulf of Mexico.



The image was acquired by the Landsat 5 Thematic Mapper (TM) on April 19, 2007.

Landsat 5 Radiometric Calibration

Effective April 2, 2007, updates to the radiometric calibration of Landsat 5 (L5) Thematic Mapper (TM) data processed and distributed by the U.S. Geological Survey (USGS) Center for Earth Resources Observation and Science (EROS) will be available. The full implementation of these processing changes will lead to an improved Landsat 5 TM data product that will be more comparable to Landsat 7 Enhanced Thematic Mapper Plus (ETM+) radiometry, and will provide the basis for continued long-term studies of the Earth's land surfaces.

Although this calibration update applies to all archived and future L5 TM data, the principal improvements in the calibration are for data acquired during the first eight years of the mission (1984 – 1991), where the change in the instrument gain values is as much as 15 percent. Additionally, the radiometric scaling coefficients for Bands 1 and 2 have also been changed for approximately the first eight years of the mission. Users will need to apply these new coefficients to convert the calibrated data product digital numbers to radiance. The scaling coefficients for the other bands have not changed.

The lifetime gain model that was implemented on May 5, 2003 for the reflective bands (1 – 5, 7) will be replaced by a new lifetime radiometric calibration curve derived from the instrument's response to pseudo-invariant desert sites and from cross-calibration with Landsat 7 ETM+. Along with the revised reflective band radiometric calibration, an instrument offset correction of 0.092 W/ (m2 sr µm) or about 0.68 K (at 300K) will also be added to all L5 TM thermal band (Band 6) data acquired since April 1999. For detailed information and background on the reasons for the change, see the Revised Landsat 5 Thematic Mapper Radiometric Calibration (2007) – PDF (300 KB)

Conferences

International Symposium on Remote Sensing of Environment (ISRSE)

June 25 – 29, 2007, San José, Costa Rica

Landsat Project Booth #4

Link to the ISRSE homepage

http://www.cenat.ac.cr/simposio/index.htm

International Geoscience and Remote Sensing Symposium (IGARSS)

July 23 – 27, 2007, Barcelona, Spain

Link to the IGARSS homepage

http://www.igarss07.org/frontal/Inicio.asp

Did You Know…?

Did you know that some Landsat Data is available for Web-enabled download?

Selected MSS, TM, and ETM+ scenes (Landsats 1-7) created for global land use and land cover research can be downloaded directly from the USGS Global Visualization Viewer (GloVis) or Earth Explorer (EE) from the Tri-Decadal Global Landsat Orthorectified single scene and Multi-Resolution Land Characterization (MRLC) datasets.

GloVis

1. Access GloVis: http://glovis.usgs.gov/
2. Define your spatial coverage by clicking on the map or entering the coordinates for the area of interest.
3. Select Sensor in the toolbar. You can then select MRLC → MRLC 2001 TC or Tri-Decadal.
4. Scroll through the available scenes and select the one that works best for you.
5. Click the "Add" tab at the bottom left of the page to add the selected scene (this will then be highlighted green on the map.)
6. Click the "Download" tab in the Scene List to download the selected scene.
7. Save the .tar file to a folder or directory and proceed to untar and unzip the files.
8. You can then open the files into your choice of image processing software.

Earth Explorer

1. Access Earth Explorer: http://earthexplorer.usgs.gov/
2. Enter the site as a Guest or as a Registered User.
3. Define your area of interest in the Spatial Coverage box.
4. Select Satellite Imagery in the Data Set Selection box and choose the sensor(s) with the download icon 
5. Define any other parameters or search restrictions and click "Search" tab.
6. When search is complete, select the scene you wish to download from the Results Summary listing.
7. Click "Start Download" and save the .tar file to a folder or directory and untar and unzip the files.
8. Then import the files into your choice of image processing software.

For more information on Web-enabled data, please access http://eros.usgs.gov/products/satellite.html.

Landsat History

Landsat…Working Beyond Expectations

When satellites are launched into orbit, expectations for a specific design life (or how long it is expected to operate) are established. All Landsat satellites (1 – 5, 7) have exceeded their design life.

Landsat 1 – 4 had a design life that exceeded expectations by an average of five years. While impressive, this statistic seems less than noteworthy when compared to Landsat 5. Orbiting the Earth since 1984, Landsat 5 continues to acquire data. Landsat 5 recently achieved 120,000 orbits, and we celebrated its 23rd birthday on March 1.

Landsat 5's success was followed by the failure of Landsat 6, which did not achieve orbit after launch in 1993. Landsat 7 was launched into orbit in 1999. Although the Scan Line Corrector failed in 2003, Landsat 7 continues its global mission and accounts for nearly all international data distribution.