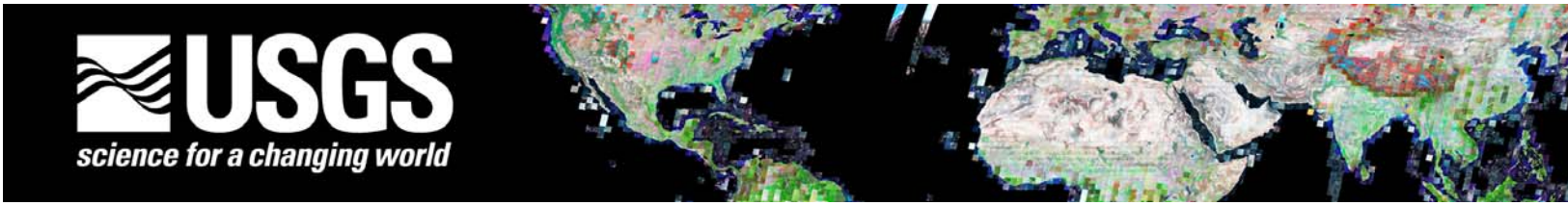


Landsat Update

Volume 3 Issue 4, 2009

Landsat 5 – Not Ready to Quit Yet

In the early morning hours of August 13, 2009, Landsat 5 experienced an attitude anomaly characterized by extreme gyro rates. The spacecraft proceeded to tumble out of control for some time until the Flight Operations Team (FOT) was able to stabilize the satellite attitude (positioning).

After evaluations of the spacecraft, image acquisitions began again on August 14, with successful downlinks to the Landsat Ground Station (LGS) in Sioux Falls, SD. Engineers evaluated the data and deemed images collected on August 14 as non-nominal due to cooler-than-normal temperatures associated with the primary focal plane of the instrument. Scenes from August 14, 2009 will not be available for download.

Evaluation of this anomaly was considered compete on August 17, 2009. All data collected at LGS beginning Saturday, August 15, 2009, are currently available for order or immediate download (http://glovis.usgs.gov or http://earthexplorer.usgs.gov).

Landsat Scenes Top One Million Downloads

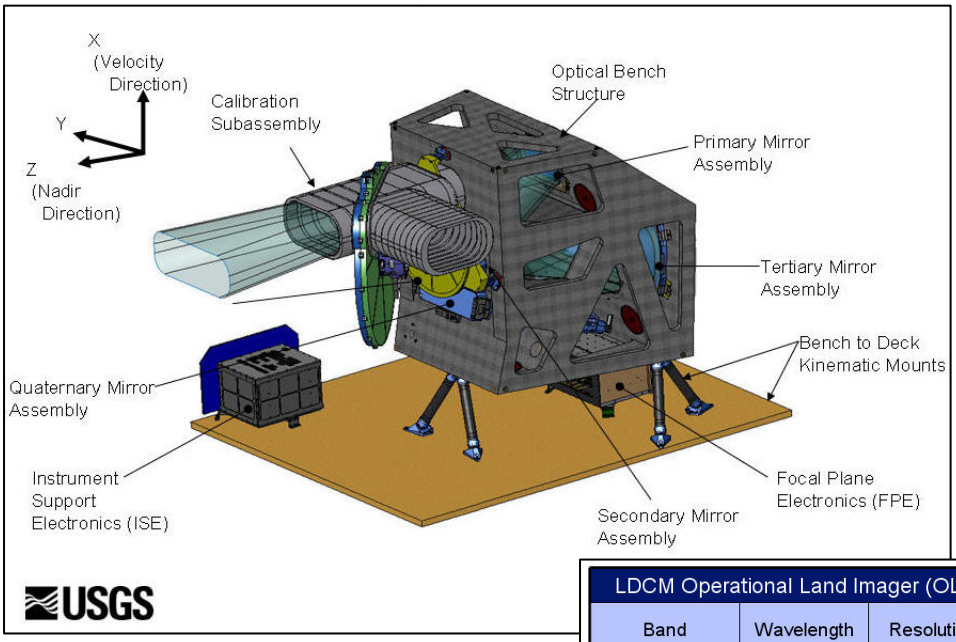
Over one million Landsat scenes have been downloaded from the USGS Earth Resource Observation and Science (EROS) Center since October 2008, when the Landsat archive was opened to user access at no charge. Free Landsat data enables non-restricted analysis of the earth's surface for years to come.

The official USGS Press Release can be found at http://www.usgs.gov/newsroom/article.asp?ID=2293&from=rss_home.

Landsat scenes are available from the Global Visualization Viewer (http://glovis.usgs.gov) or EarthExplorer http://earthexplorer.usgs.gov).

LDCM News – The LDCM Operational Land Imager (OLI) Instrument Overview

Just as the Landsat Data Continuity Mission (LDCM) will continue to expand the record of Earth observations, the instrument onboard Landsat 8 will supply enhanced data, with the addition of deep blue and cirrus bands on the Operational Land Imager (OLI). Slight modifications have been made to the other bands that closely resemble the existing Enhanced Thematic Mapper Plus (ETM+) sensor specifications.



LDCM Operational Land Imager (OLI)		
Band Number	Wavelength (µm)	Resolution (m)
8 (pan)	.500-.680	15
1*	.433-.453	30
2	.450-.515	30
3	.525-.600	30
4	.630-.680	30
5	.845-.885	30
9**	1.360-1.390	30
6	1.560-1.660	30
7	2.100-2.300	30
*10****	*10.3 - 11.3*	*120*
*11****	*11.5 - 12.5*	*120*

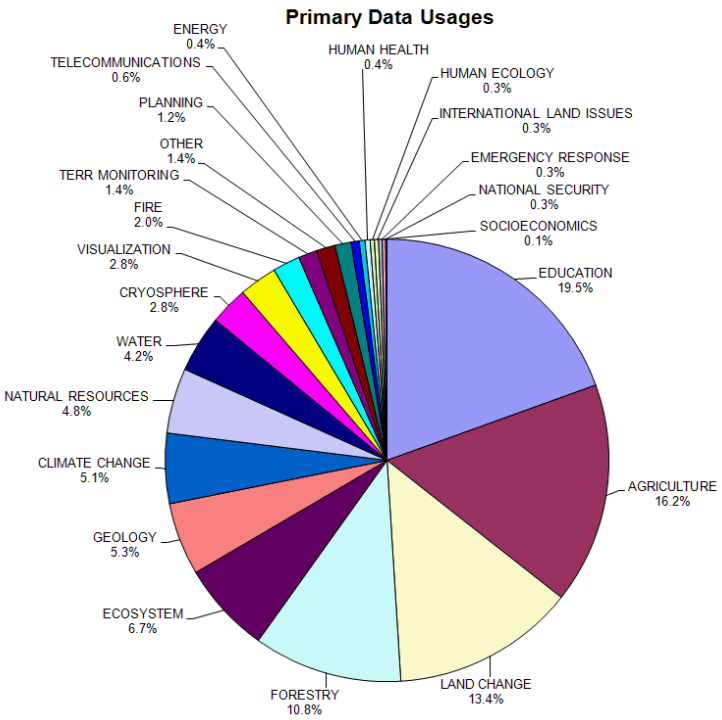
Landsat 7 ETM+		
Band Number	Wavelength (µm)	Resolution (m)
8 (pan)	.52-.90	15
1	0.45-0.52	30
2	0.53-0.61	30
3	0.63-0.69	30
4	0.78-0.90	30
5	1.55-1.75	30
7	2.09-2.35	30
6 (thermal)	10.40-12.50	60

USGS

* New Deep Blue Band
** New Cirrus Band
*** Thermal (TIRS) TBD

Landsat Free Archive – How Landsat Data are Being Used

Statistics as of August 31, 2009



Meetings & Conferences

The Landsat Science Team Meeting was held June 22 – 24, 2009 at the Rochester Institute of Technology (RIT) for Imaging Science, in Rochester, New York. Working Group discussions, Landsat Updates and other related items were reported. The agenda and links to all presentations are located at http://landsat.usgs.gov/science_june2009MeetingAgenda.php.

Tips & Tricks – Viewing a Gap-mask File in Photoshop

Gap-mask files contain data values of (0=no data and 1=populated data), and when converted to brightness and first imported into Photoshop, will appear black. This is because Photoshop uses data value numbers, whereas remote sensing imaging software typically uses Digital Number (DN) values of 0 and 255 to create a black and white display.

Photoshop's Equalize tool sorts pixel values within an image so the lowest value represents black and the highest value represents white. To Equalize an image, select *Image →Adjustments→ Equalize* from the main menu. The file will then appear correctly.

Landsat Science Team Spotlight – Dr. Lazaros Oreopoulos

Dr. Lazaros Oreopoulos began his career at NASA Goddard Space Flight Center in 1997. He is a research physical scientist, with interests in atmospheric radiation and cloud modeling. Cloud detection and avoidance are the primary focus points of his research as a member on the Landsat Science Team.

He provides advice on cloud masking issues as well as the handling of cloud scores, forecasts, and climatologies by the next generation Long Term Acquisition Plan. He also attempts to simulate reflectance of the new OLI cirrus bands for different atmospheric, surface, and cloud configuration scenarios.

Working with scenes that other scientists find of limited value, Oreopoulos's interest in the three-dimensional effects of cloud cover leads him to study how these effects can be detected using power spectrum analysis of TM and ETM+ reflectance. He also developed cloud retrieval techniques that minimize the effects.

Recent publications relating to cloud detection and studies include

- Sotiropoulou, R.-E. P., N. Meskhidze, J. Kouatchou, B. Das, L. Oreopoulos, J. M. Rodriguez, and A. Nenes, 2009: Aerosol - cloud interactions in the NASA GMI: Model development and indirect forcing assessments. Atmos. Chem. Phys. (Submitted)

- Oreopoulos, L., S. Platnick, G. Hong, P. Yang, and R. F. Cahalan, 2009: The shortwave radiative forcing bias of liquid and ice clouds from MODIS observations. Atmos. Chem. Phys. Disc. 9, 10337-10366. [Abstract] [Full Text (PDF)]

For more information on his scientific interests, see http://climate.gsfc.nasa.gov/~lazaros/.

EROS Authors in Recent Publications

Reeves, M.C., Ryan, K.C., Rollins, M.G., and Thompson, T.G., 2009, Spatial fuel data products of the LANDFIRE Project: International Journal of Wildland Fire, v. 18, no. 3, p. 250-267.
http://dx.doi.org/10.1071/WF08086

Rollins, M.G., 2009, LANDFIRE: a nationally consistent vegetation, wildland fire, and fuel assessment: International Journal of Wildland Fire, v. 18, no. 3, p. 235-249.
http://dx.doi.org/10.1071/WF08088

Vogelmann, J.E., Tolk, B., and Zhu, Z., in press, Monitoring forest changes in the southwestern United States using multitemporal Landsat data: Remote Sensing of Environment.
http://dx.doi.org/10.1016/j.rse.2009.04.014

Chen, X., Liu, S., Zhu, Z., Vogelmann, J., Li, Z., and Ohlen, D., in press, Estimating aboveground forest biomass carbon and fire consumption in the U.S. Utah High Plateaus using data from the Forest Inventory and Analysis Program, Landsat, and LANDFIRE: Ecological Indicators.
http://dx.doi.org/10.1016/j.ecolind.2009.03.013

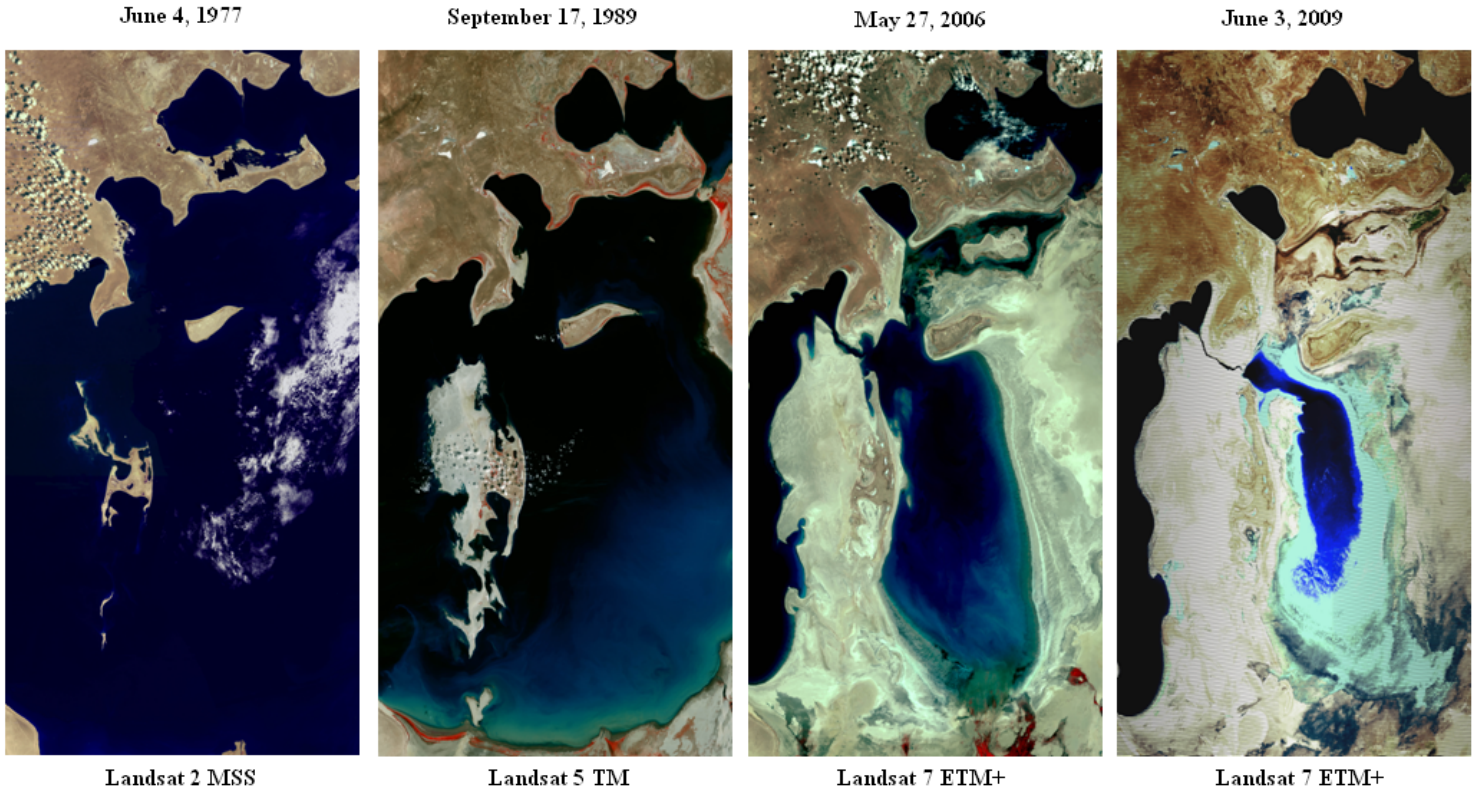
Zhao, S., Liu, S., Yin, R., Li, Z., Deng, Y., Tan, K., Deng, X., Rothstein, D., and Qi, J., in press, Quantifying terrestrial ecosystem carbon dynamics in the Jinsha Watershed, Upper Yangtze, China from 1975 to 2000: Environmental Management.
http://dx.doi.org/10.1007/s00267-009-9285-9

Beighley, R.E., Eggert, K.G., Dunne, T., He, Y., Gummadi, V., and Verdin, K.L., 2009, Simulating hydrologic and hydraulic processes throughout the Amazon River Basin: Hydrological Processes, v. 23, no. 8, p. 1221-1235.
http://dx.doi.org/10.1002/hyp.7252

Huang, C., Goward, S.N., Masek, J.G., Gao, F., Vermote, E.F., Thomas, N., Schleeweis, K., Kennedy, R.E., Zhu, Z., Eidenshink, J.C., and Townshend, J.R.G., 2009, Development of time series stacks of Landsat images for reconstructing forest disturbance history: International Journal of Digital Earth, v. 2, no. 3, p. 195-218.
http://dx.doi.org/10.1080/17538940902801614

Landsat Images of Interest – The Vanishing Aral Sea

The Aral Sea, located in Kazakhstan and Uzbekistan in central Asia, was once one of the largest inland bodies of salty reservoirs in the world and the second largest sea in Asia. Over the last 30 years, the Sea has diminished in capacity dramatically, as shown in these images captured by the Landsat series of satellites. A major factor causing the shrinkage is the drawing off by upstream feeder streams for crop irrigation. As the sea diminishes, noticeable changes in climate conditions and increasing sandstorms are affecting the area.



A poster can be viewed and downloaded from the Landsat Gallery.