

LANDSAT Update - Volume 2, Issue 3, 2008

Secretary Kempthorne Showcases Free Public Availability of Landsat Satellite Image Archive at ESRI Conference

SAN DIEGO, CA -- Secretary of the Interior Dirk Kempthorne announced at the ESRI Conference that his direction to the U.S. Geological Survey (USGS) to make its 35-year Landsat satellite image archive available over the Internet for free marks the commitment of the department to breaking down information barriers.

“With the click of a mouse, scientists, government officials and land managers will be able to see the changes in the earth’s landscape at any point in the past three and a half decades,” he told the conference on Saturday. Some 14,500 participants are gathered this week in San Diego for the ESRI conference.

"This is a great contribution," said ESRI President Jack Dangermond. "It will open up new avenues for geographic understanding around the globe. It represents the democratization of digital data and empowers people everywhere with rich information."

The USGS, an Interior agency, expects to have the full archive online by February 2009. The Department of the Interior has the responsibility for coordinating the geospatial activities of the entire federal government through the Federal Geographic Data Committee.

“As Secretary of the Interior, I have made breaking down barriers and building bridges a high priority of the department,” Kempthorne said. “We are fully committed to this task.”

The Landsat archive is an unequalled 35-year record of the Earth’s surface that is valuable for a broad range of uses from climate change science to forest management to emergency response. As an example of uses for the archive, Kempthorne showed a Landsat image of Las Vegas in 1973 compared with an image from 2000. The juxtaposition of the images provided a dramatic picture of the explosive population growth and the rapid spread of the city into the surrounding desert ecosystems.

"Data is the power in the engine of innovation," said geographer Roger Tomlinson, an emcee at the ESRI conference known as the “father of GIS.”

A technical announcement of the Landsat archive’s availability can be found at http://landsat.usgs.gov/images/squares/USGS_Landsat_Imagery_Release.pdf

Landsat Science Team Spotlight

Feng Gao, Senior Scientist

Earth Resources Technology, Inc. & NASA Goddard Space Flight Center



Figure 1. Feng Gao, Senior Scientist

Feng Gao has 15 years of experience in remote sensing modeling and applications. He has been actively involved in Landsat data processing, new algorithm development, and multi-sensor data fusion using Landsat and MODIS data.

His focus on the Landsat Science Team is to develop a consistent Landsat dataset from MSS, TM/ETM+, and international Landsat-like data sources for land cover change detection. (View his [presentation](#) from the January 2008 Science Team Meeting.)

Gao received his PhD in Geography at Beijing Normal University, China, in 1998. He had a major role in the development of the [MODIS Bidirectional Reflectance Distribution Function \(BRDF\)/Albedo](#) product from 1998 to 2004.

Gao has published articles in *IEEE Geoscience and Remote Sensing* (“[On the Blending of the Landsat and MODIS Surface Reflectance: Predicting Daily Landsat Surface Reflectance](#)” Vol. 44, August 2006) and in the *Journal of Geophysical Research* ([MODIS bidirectional reflectance distribution function and albedo Climate Modeling Grid products and the variability of albedo for major global vegetation types](#)”, Vol. 110, January 2005,)

The International Charter "Space and Major Disasters"

The International Charter "Space and Major Disasters" is an agreement designed to mitigate the effects of disasters on human life and property. Established in 2000, the Charter seeks to provide a unified system of space data acquisition and delivery through Authorized Users to help those affected by natural or man-made disasters. The Charter has been activated in response to over 200 hazards since its inception.

On May 4, 2008, the Nargis cyclone hit the country of Burma (Myanmar) causing devastation to Rangoon (Yangon), the capital of Burma, and the surrounding area. The Charter was activated in response to this emergency, and within hours of activation, Landsat images were delivered to agencies and first responders.

These Landsat 7 images show the Gulf of Martaban. The city of Rangoon is the grey area in the center and to the west of the Gulf where two rivers converge slightly inland. Rangoon is easily seen in the March 3 image. Although cloudy, the area of inundation is evident in the May 5, 2008, image.

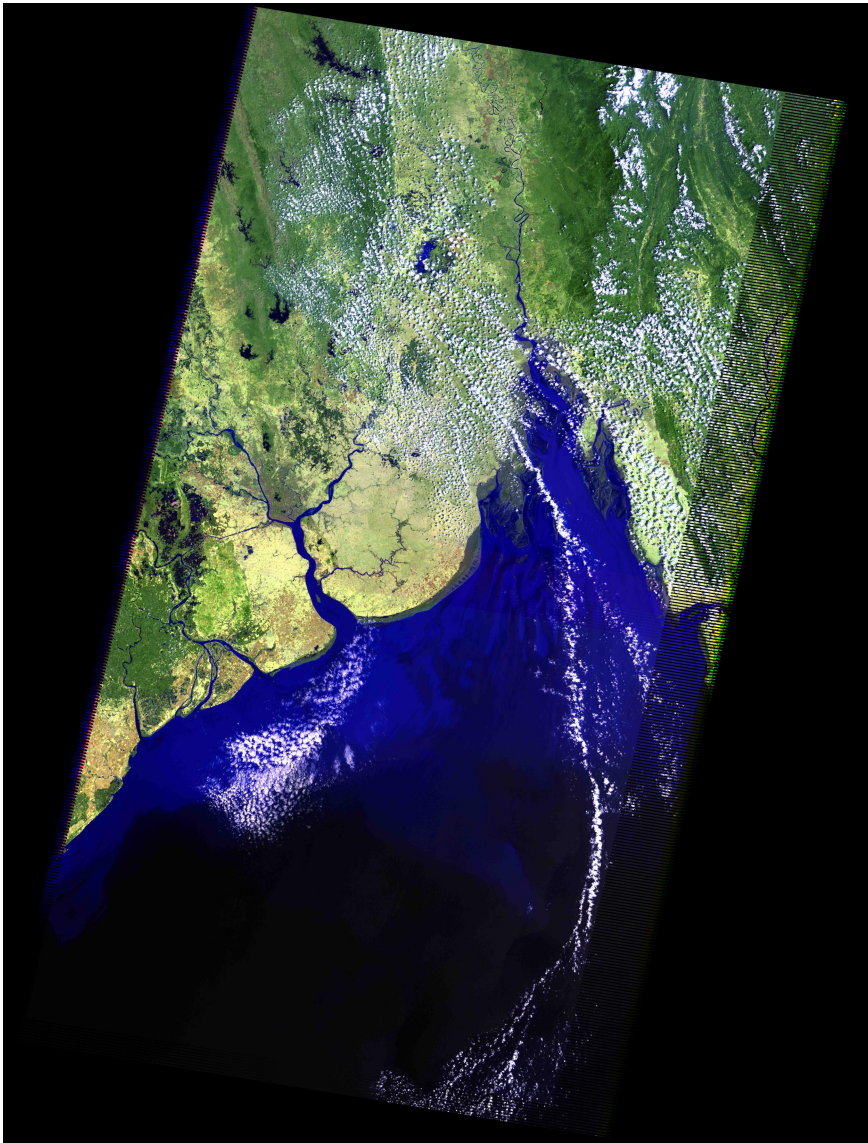


Figure 2. Gulf of Martaban image, March 3, 2008. Path 132, Row 48 & 49. Bands 7,5,3

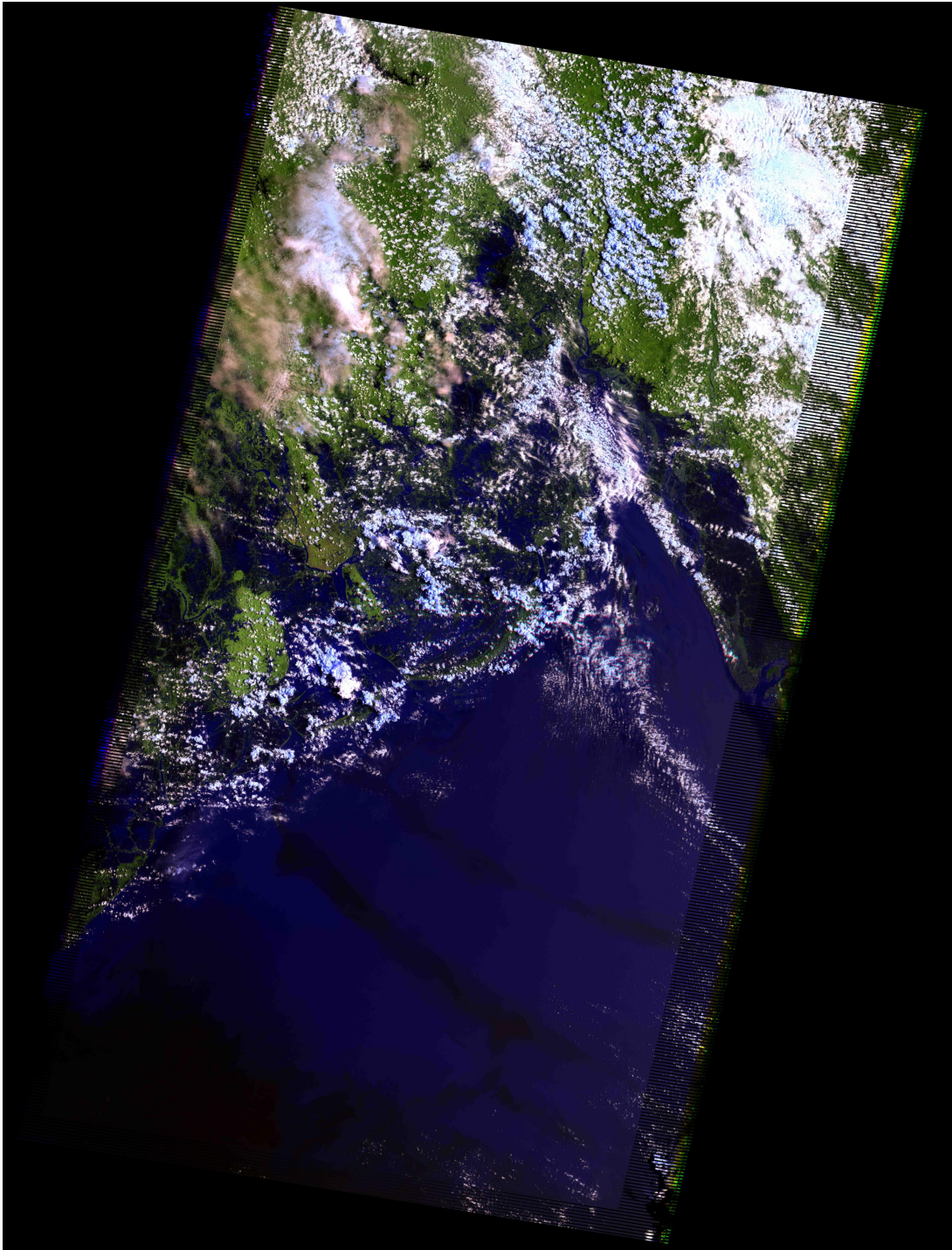


Figure 3. Gulf of Martaban image, May 5, 2008. Path 132, Row 48 & 49. Bands 7,5,3

EROS Authors in Recent Publications

Landsat data in peer-reviewed, published articles.

Radiative forcing over the conterminous United States due to contemporary land cover land use albedo change

GEOPHYSICAL RESEARCH LETTERS, VOL. 35, L09706, doi:10.1029/2008GL033567, 2008

Christopher A. Barnes and David P. Roy

Received 6 February 2008; revised 28 March 2008; accepted 4 April 2008; published 9 May 2008.

<http://www.agu.org/journals/gl/g10809/2008GL033567/2008GL033567.pdf>

Identifying Mangrove Species and Their Surrounding Land Use and Land Cover Classes Using an Object-Oriented Approach with a Lacunarity Spatial Measure

GIScience and Remote Sensing, v. 45, no. 2, p. 188-208.

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<http://bellwether.metapress.com/content/j513751t653p6282/fulltext.pdf>

Did You Know? From the [Landsat Legacy Project](#)

<http://library01.gsfc.nasa.gov/landsat/>

Landsat data revealed a fault across the proposed path of a new gas pipeline in Bolivia. Engineers chose a different route that avoided the fault zone. The new path was actually shorter than the original one, an unexpected but welcome benefit.

Landsat 5 25th Anniversary Images

To honor the 25th year of Landsat 5, the Landsat Project has added 33 images to the Landsat Image Gallery spanning the life of the satellite. Launched in 1984, Landsat 5 has collected over 192 terabytes of data (over 766,000 scenes) during its 3.2-billion-mile journey.

From Australia to Yellowstone, Alaska to the Volga River Delta in Russia, the imagery is remarkable. The images showcase the diversity of land and habitats that make Earth unique and spectacular. These scenes and other imagery in the Landsat Image Gallery are available for high-resolution download. Go to the [Landsat website](#) and click the Gallery tab.

Landsat Science Team Meeting

The fourth meeting of the Landsat Science Team was held July 15-17, 2008, in Reston, Virginia, USA.

A status review of Landsat 5 and 7 satellites and Landsat Data Continuity Mission (LDCM) development progress (with high focus on the Operational Land Imager) were the primary topics of discussion. Science and applications results from Landsat Science Team Principal Investigator research activities were also presented.

The outcomes from the meeting included:

- Acknowledgment of USGS efforts to open the Landsat archive to no-cost access, and reiteration of the importance of the earliest possible LDCM launch
- The urgent need to begin planning Landsat 9
- The authorization of a National Land Imaging Program that ensures the operational status of Landsat.

The meeting agenda and presentation materials can be found on the USGS Landsat Web site:

http://landsat.usgs.gov/science_LST_Team_Meetings.php.

Tips and Tricks

Figure 4 shows general Landsat 5 seasonality and Worldwide Reference System (WRS) row cutoffs. The green band represents the area of the earth that could be collected year-round. The range of data collections possible for any given latitude corresponding to any given date can be ascertained by following the yellow lines. For example, from approximately April 22 through August 12, all of Greenland could be included in data collections. Because Landsat 5 requires a ground station for live downlink, only the stations in Figure 5 can actively receive images over their areas. For more information on domestic and international ground stations, please see http://landsat.usgs.gov/about_ground_stations.php.

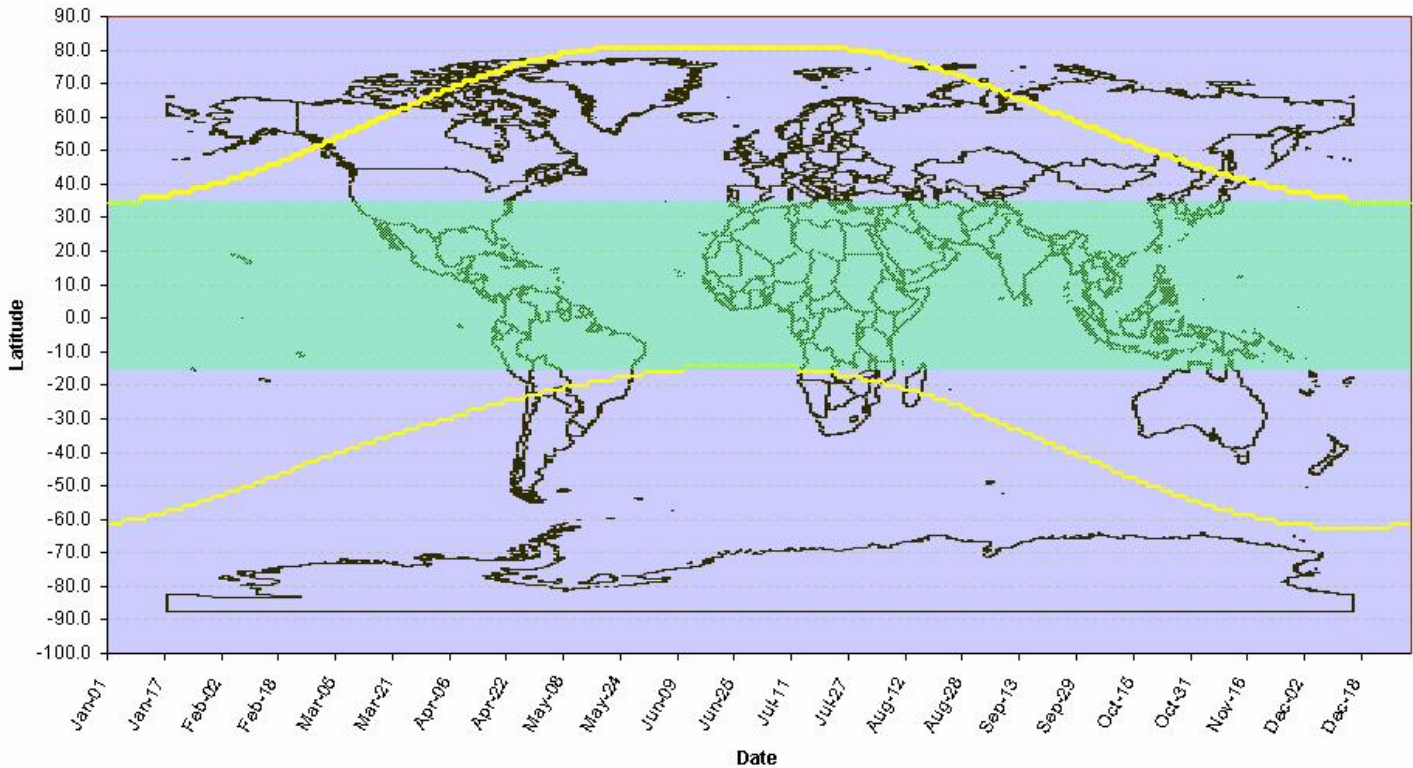


Figure 4. Latitude Cutoff vs Date

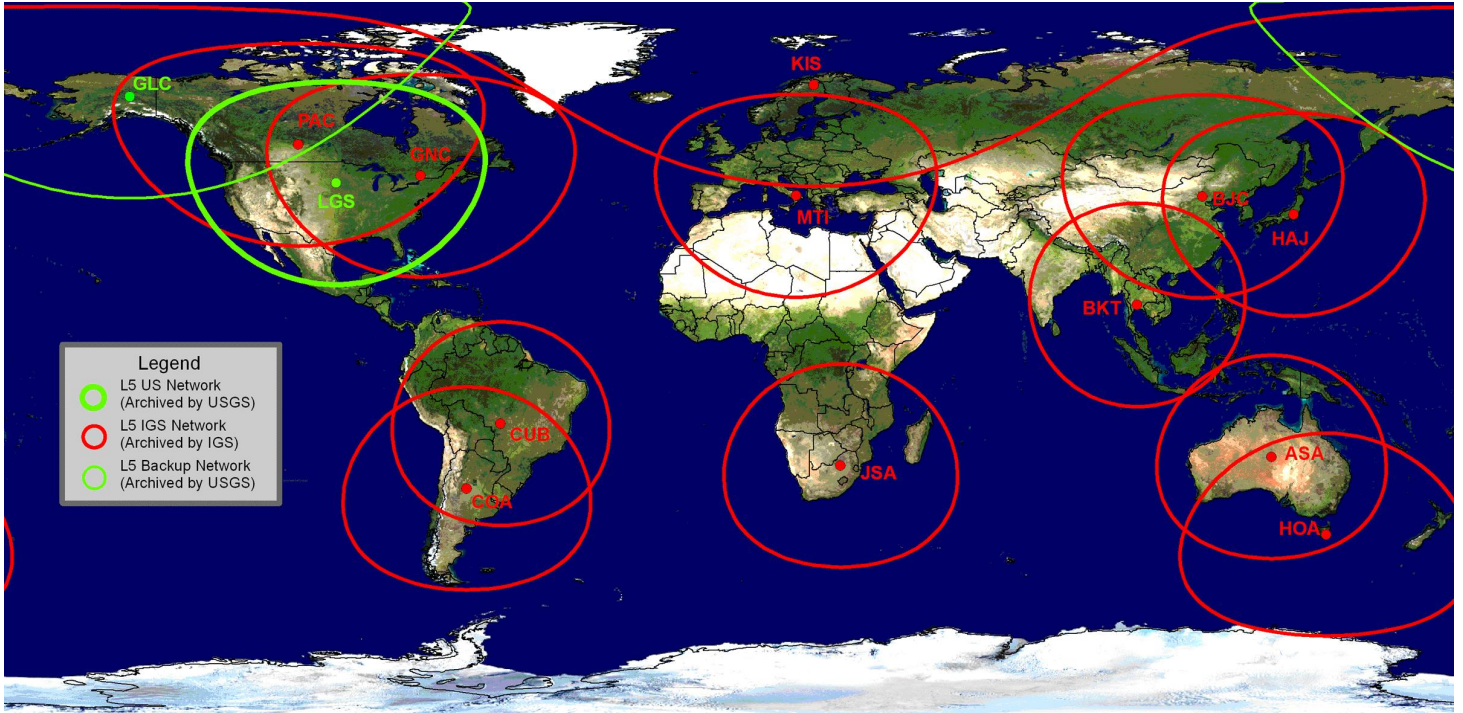


Figure 5. Landsat 5 International Ground Station Network