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MSS Data Products now created with LPGS processing system

As of September 15, 2010, all MSS data are processed using the LPGS processing system. Previously processed using NLAPS, the new products are now consistent with Landsat ETM+ and TM data products.

A Landsat Milestone: Four Million Scenes

When the U.S. Geological Survey (USGS) opened the Landsat archive to user access at no charge in October, 2008, nobody could have predicted that four million scenes would be distributed in such a short period.

On Thanksgiving Day, November 25, 2010, a user downloaded the four-millionth Landsat image from a USGS Web site at its Earth Resources Observation and Science (EROS) Center in Sioux Falls, South Dakota. Presently, more data are distributed in one week than in the year prior to the archive being opened.

"USGS satellite operations and its data archives at EROS enable experts, or any interested member of the public, to see the land objectively with unbiased, consistently calibrated data. The historical depth and reliability of these earth observations are vital to scientists and land managers across the country and across the Department of the Interior in projects that range from climate change studies and invasive species surveys to the monitoring of drought and assessment of wildfire damage," said Secretary of the Interior, Ken Salazar.

The Landsat science mission is to gather data of the Earth's land surfaces at a scale where natural and human-induced changes can be detected, characterized, and monitored over time. These data are used for a wide array of activities such as monitoring land change, assessing the impacts of wildfires, and detecting evidence of climate change.

Landsat scenes can be previewed and downloaded through the USGS Global Visualization Viewer (http://glovis.usgs.gov) or USGS EarthExplorer (http://earthexplorer.usgs.gov).

Too Close for Comfort

Both Landsat 5 and Landsat 7 orbit the earth at 705 km above the surface (about 435 m) and travel at around 17,000 miles per hour. At these speeds, crashing into something else, like another orbiting satellite or space debris, could do major damage. When a communication satellite owned by Iridium (a U.S. company) collided with a non-functioning Russian satellite (COSMOS 2251) in February 2009, it created over 2,500 pieces of debris, and that doesn't count the small pieces!

In July of 2010, two pieces of debris from the Iridium/Cosmos 2251 collision came close enough to the Landsat spacecrafts to cause some concern (called conjunctions). While maneuvers can be done to avoid collisions, it uses fuel which is vital for normal operations. In these instances, the closest debris was 1.7 km, considered far enough away to avoid a maneuver. In August however, Landsat 5 was heading within 56 m (183 ft) of COSMOS 2251 debris, so an avoidance maneuver was conducted on August 24th. In all, there were 12 conjunctions in August that required monitoring to ensure spacecraft safety.

The U.S. military's Space Surveillance Network began tracking items in space when Russia launched Sputnik I in 1957. It now tracks more than 8,000 manmade objects in Earth's orbit. The objects are all baseball size or larger and only 7 percent are operational satellites - the rest are pieces of debris.

Meetings & Conferences

Landsat Technical Working Group Meeting
May 23-27, 2011
USGS EROS
Sioux Falls, South Dakota

Association of American Geographers Annual Meeting
April 12-16, 2011
Seattle, Washington
http://www.aag.org/cs/annualmeeting

Tips and Tricks – G-Verify Image

The g-verify image is a new file added to the MSS package (_VER.jpg). This is a quick look at the geometric accuracy of an image. These points and the root mean square error (RMSE) will change from image to image dependent upon cloud cover, shadows, or drops in water bodies. The g-verify is not used as a control, but rather as an independent source for verification of geo-locational accuracy. For more information about the g-verify products, see http://landsat.usgs.gov/NewMSSProduct.php.

EROS Authors in Recent Publications

Hale, R.C., Gallo, K.P., Tarpley, D., and Yu, Y., 2011, Characterization of variability at *in situ* locations for calibration/validation of satellite-derived land surface temperature data: Remote Sensing Letters, v. 2, no. 1, p. 41-50.
http://www.informaworld.com/10.1080/01431161.2010.490569

Giri, C.P., Ochieng, E., Tieszen, L.L., Zhu, Z., Singh, A., Loveland, T.R., Masek, J., and Duke, N., in press, Status and distribution of mangrove forests of the world using earth observation satellite data: Global Ecology and Biogeography.
http://dx.doi.org/10.1111/j.1466-8238.2010.00584.x

Li, M., Mao, L., Zhou, C., Vogelmann, J.E., and Zhu, Z., in press, Comparing forest fragmentation and its drivers in China and the USA with Globcover v2.2: Journal of Environmental Management.
http://dx.doi.org/10.1016/j.jenvman.2010.07.010

Lu, Z., Dzurisin, D., Jung, H.-S., Zhang, J., and Zhang, Y., 2010, Radar image and data fusion for natural hazards characterization: International Journal of Image and Data Fusion, v. 1, no. 3, p. 217-242.
http://www.informaworld.com/10.1080/19479832.2010.499219

Gu, Y., and Wylie, B.K., 2010, Detecting ecosystem performance anomalies for land management in the Upper Colorado River Basin using satellite observations, climate data, and ecosystem models: Remote Sensing, v. 2, no. 8, p. 1880-1891,
http:dx.doi.org/10.3390/rs2081880

Landsat Image of Interest – Flooding along the Gulf of Carpentaria Queensland, Australia

Nearly every week, the USGS prepares and disseminates an image that demonstrates how Landsat can be used for a variety of land change topics or current events. Please visit **http://landsat.usgs.gov** for more information. You can also subscribe to the RSS feed to be notified of newest additions- **http://landsat.usgs.gov/landsatimagegallery.rss**

Landsat 5 data, acquired over the Gulf of Carpentaria, illustrate the dramatic effects of flooding in this northern region of Australia.

The coastal area of the Gulf is a major resort area, as well as a source for extensive bauxite and manganese excavation. The (left to right) Nicholson, Leichhart, Flinders, and Carron Rivers drain from the central lowlands of Queensland into the Gulf, eventually flowing into the Arafura Sea. The light tone along the sea coast shows the rare example of an epicontinental sea, a shallow sea on top of the continent extension.

The October 3, 2010, image shows the drainage from the rivers (in shades of blue) into the beach and salt flats along the coast. The January 23, 2011, image shows the effects of historic rainfall upstream. Blue tones show the inundation of coastal lands and turbidity masking the subsurface continental shelf.

The Landsat data provide a permanent record of land surface change, which shows the rising and eventual falling of river levels and the effects of flooding on mining and recreational development.