

2000 Landsat Updates

October 2000

Presidential Decision Directive

On October 16, 2000, President Clinton signed the revised Presidential Decision Directive (PDD) that transfers authority from National Oceanic and Atmospheric Administration (NOAA) to U.S. Geological Survey (USGS) to manage and operate the Landsat 7 system. The Directive gives USGS complete responsibility for Landsat 7 operations, including flight operations and contract oversight for Landsat 4 and 5. As a result of the signing of the PDD, the Department State has granted to the USGS the authority to enter into agreements with International Cooperators (ICs) for the reception and distribution of Landsat 7 data.

New Ground Station Activity

The Indonesian Ground Station located at Parepare has received Landsat 7 downlinks during October for testing purposes. The Indonesian Ground station plans to be operational as of November 1, 2000. In addition, test downlinks will be sent to the ground station at Bangkok, Thailand during the week of November 6, 2000.

Product Pricing

The Landsat 7 Program has proposed to USGS management to maintain the product prices that have been in effect since the start of Landsat 7 operations, namely Level 0 Reformatted (L0R) products at \$475 per scene and Level 1 Radiometrically Correct Products (L1R) and Level 1 Geometrically Corrected Products (L1G) at \$600 per scene. We anticipate approval to continue with our bulk-order prices (20% less than standard prices) for product orders of 25 or more scenes per order.

NORAD TLE

The Mission Operations Center (MOC) has installed a software upgrade that allows them to generate North American Air Defense (NORAD) Two Line Element (TLE) ephemeris data. The MOC has been posting their TLE product on the Web (ls7pm3.gsfc.nasa.gov/orbels.html). The MOC-generated TLE data are more accurate than the previous TLE data generated by the US Space Command. The MOC performs orbit determinations daily and uses both ground and space based two-way Doppler measurements. The MOC is requesting feedback from ICs regarding the accuracy of this new data set (rich.lonigro@gsfc.nasa.gov)

Metadata Interoperability Proposal

To date, the Canada Centre for Remote Sensing (CCRS) and the Australia Centre for Remote Sensing (ACRES) have accepted the EROS Data Center (EDC) offer to receive EDC-purchased software for metadata interoperability. Other ICs interested in the EDC Metadata Interoperability proposal should contact John Faundeen (Faundeen@usgs.gov)

The 29th Landsat Ground Station Operations Working Group (LGSOWG)

The meeting in Beijing, China, September 18-22, 2000, included representatives from 10 countries representing 12 International Ground Stations (IGSs): Australia, Brazil, Canada, China, Italy, Germany, Indonesia, Japan, South Africa and the U.S. In addition, representatives from Eurimage, MacDonald Dettwiler and Associates, and SPOT Image (Beijing) were in attendance. Space Imaging representatives were unable to attend. The focus of the meeting was on the adoption of a new acquisition prioritization scheme and the Data Exchange Annex to the Memorandum of Understanding between USGS and the International Cooperators. The LGSOWG-29 meeting resulted in a consensus to implement the 3-tiered prioritization scheme for requesting Landsat 7 data. In addition, the Data Exchange Annex was approved in principle with recommended changes. One recommendation from this meeting resulted in establishing this monthly report to improve communications with the International Ground Station community regarding Landsat 7 and related news. The meeting in Beijing provided a wonderful opportunity to visit the facilities and personnel of the China Remote Sensing Satellite Ground Station located in Miyun County northeast of Beijing and the Headquarters in Beijing that is the site for most of the meetings.

The 9th Landsat 7 Technical Working Group Meeting (LTWG-9)

This meeting is scheduled for February 19-22, 2001 at the Melia Tamarindos Hotel near Maspalomas, Gran Canaria (Canary Islands, Spain). The announcement, logistical information, and an agenda will be sent to LGSOWG and LTWG members in early November.

Landsat 7 Science Team

Landsat 7 Science Team The Landsat 7 Science Team meeting will be held in Warrenton, Virginia on November 6-9.

CEOS Plenary

The 14th Committee on Earth Observing Satellites (CEOS) Plenary Meeting will be held November 8-10, 2000 in Rio de Janeiro. Planning to attend are: R. J. Thompson, Landsat 7 Program Manager; Raymond Byrnes, USGS Satellite Programs liaison; and Dr. Charles J. Groat, Director of the USGS. The USGS has submitted a proposal for acceptance as a CEOS Plenary member.

EO-1 Launch

The launch of Earth Observing 1 (EO-1), originally scheduled for November 16, 2000, has slipped to no earlier than November 18 and possibly as late as November 20. The data collected will be processed and distributed to the EO-1 science team from the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center (GSFC). In the future EO-1 data will be archived and distributed to the public from the EROS Data Center.

Aqua Launch

A new launch date for Aqua has not been officially established and announced; however, it is unlikely to be launched prior to July 12, 2001.

Quickbird 1 Launch

EarthWatch, Inc. of Longmont, Colorado, will launch its QuickBird 1 high-resolution imaging satellite November 19, 2000, from Plesetsk Cosmodrome in northern Russia.

Terra Data Distribution

Selected higher-level MODIS land data products are available for distribution from the Land Processes Distributed Active Archive Center (DAAC) at the EROS Data Center. A firm release date for the distribution of Advanced Spaceborne Thermal Emission and Reflection ASTER data and higher-level products from the EDC DAAC has not yet been set.

November 2000

USGS Announces MOC Contractor

The U.S. Geological Survey (USGS) announced the award of the Landsat 7 Flight Operations contract to Honeywell Technical Solutions Incorporated (HTSI) on November 15, 2000. HTSI supported Landsat 7 pre-launch operations and has operated the Landsat 7 spacecraft since the beginning of normal operations in July 1999.

Landsat 7 Downlinks

In November, the Indonesia Ground Station at Parepare, Indonesia, started receiving Landsat 7 data operationally, and the Brazilian Ground Station in Cuiaba, Brazil resumed Landsat 7 operations. Operational International Ground Stations (IGSs) now number 14. Landsat 7 test data were successfully received and processed by the Thailand and University of Puerto Rico ground stations this month. These stations expect to be operational in the first or second quarter of CY 2001.

MOC 3-Tier Software

The Landsat 7 Mission Operations Center (MOC) anticipates a December 4, 2000 software delivery that will add the 3-Tier IGS acquisition priority capability. Over the last six months each station has negotiated a scheduling priority mask, and on October 12 each station was sent a copy of the acquisition mask to be implemented by the MOC. The stations were asked to review and approve the mask. On December 4 the MOC will begin scheduling the IGS service requests based on the approved 3-tier priority mask received from each International Cooperator (IC).

Metadata Exchange Successes

The EROS Data Center Distributed Active Archive Center (DAAC) has completed testing metadata ingest with the two Canadian ground stations. The DAAC plans to begin receiving metadata from these two stations on an operational basis in late December. Metadata testing continues with metadata received from Australia and the European Space Agency.

Landsat 7 Calibration Parameter File

Landsat 7 data quality remains excellent. The Image Assessment System Team, with support from the Landsat Project Science Office at National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center (GSFC), is preparing the next Calibration Parameter File (CPF) release. In this CPF release, scheduled for December 31, 2000, refinements to the geometric/geodetic alignment coefficients will be included to further improve the registration of Landsat 7 products.

The 9th Landsat 7 Technical Working Group Meeting (LTWG-9)

Plans for the February 19-22, 2001 meeting for LTWG-9 are proceeding. The first announcement and information about hotel reservations has been sent to the international cooperators. Participants are encouraged to communicate with our logistics coordinators in making hotel reservations as soon as possible.

LDCM Workshop

A Landsat Data Continuity Mission (LDCM, Landsat follow-on) workshop will be held at the USGS National Center in Reston, Virginia, January 9-10, 2001, to discuss the LDCM Data Specification and the LDCM Data Policy. The workshop is an open meeting. Please see the LDCM website (ldcm.usgs.gov) for registration information.

CEOS Meeting

The USGS applied for and was unanimously accepted for membership in the Plenary forum of the international Committee on Earth Observing Satellites (CEOS) at the 14th CEOS Plenary meeting, held in November in Rio de Janeiro. Acceptance of the USGS is based upon the recent transition of responsibility for Landsat 7 mission operation from NASA to the USGS. CEOS participation will enhance the USGS's ability to manage the Landsat 7 Program and to coordinate activities with our ICs.

LDCM Website

The Landsat Data Continuity Mission has established a website to disseminate relevant information about the mission. The LDCM Data Specification document is available for review at <http://ldcm.usgs.gov>.

ASTER Data Distribution

The EROS Data Center began distributing Advanced Spaceborne Thermal Emission and Reflection (ASTER) data to the public on November 10, 2000. Users can access and order ASTER data through the Earth Observing System Data Gateway (edcimswww.cr.usgs.gov/pub/imswelcome)

EO-1/SAC-C Launch

The Earth Observing 1 (EO-1) satellite was launched from Vandenberg Air Force Base in California on a Delta II rocket at 10:24 AM PST on November 21, 2000. The same rocket also placed SAC-C (Satelite de Aplicaciones Cientificas-C; Argentina) into its respective orbit. All systems on EO-1 are performing nominally and initial data from this instrument appear extremely promising.

SAC-C subsystems are also working properly and within specifications. Signals have been received by the four ground tracking stations: Norway, MacMurdo in Antarctica, Poker Flats in Alaska, and Wallops Island, Virginia. SAC-C data have been successfully downloaded to Cordoba, Argentina and the data are being analyzed. The engineering phase of the mission has begun and should take 30 days. Normal operations will begin at the start of the new year.

Quickbird Launch

Unfortunately, the Quickbird 1 satellite launched November 20, 2000 did not achieve orbit. A second Quickbird launch is being planned in about six months.

December 2000

New Landsat 7 Agreements

The Memorandum of Understanding (MOU) between the U.S. Geological Survey (USGS) and the National Institute for Space Research (INPE) in Brazil was signed December 26, 2000. The Landsat 7 Program welcomes INPE to the Landsat 7 International Ground Station (IGS) community. In addition, the USGS and the Council for Scientific and Industrial Research (CSIR) in South Africa have reached agreement to authorize Landsat data reception at the CSIR Space Applications Center (SAC) in Pretoria. South Africa intends to begin downlink testing in late January. We welcome the SAC team to the network of operational Landsat 7 International Cooperators (ICs).

Out With the Old, In With the New

Thank you to our many friends and cooperators throughout the world for your contributions, advice, business, and support during this past year of tremendous success and progress of the Landsat 7 Mission and Program. Landsat personnel from National Aeronautics and Space Administration's (NASA's) Landsat Project Science Office and Earth Science Mission Operations Office, the USGS Program and Mission Management staff, and our team of operations and engineering staff from Honeywell Technology Solutions, Inc. and Raytheon are looking forward to new challenges and accomplishments during 2001. We wish you all a HAPPY NEW YEAR!

USGS Funding Support for Landsat 7 Mission Operations

The USGS has completed the first cycle of budgetary planning for FY 2001 and was successful in securing additional appropriated funds for majority funding for Landsat 7 Mission Operations, adding approximately \$5 million to the funding base for the Landsat 7 Program. While this funding does not completely solve our FY 2001 budgetary problems, it is a major contribution to stabilizing the financial foundation for the Program, both for this year and for the anticipated life of the mission.

Antarctica Campaign

The Landsat 7 Program began a campaign on November 20, 2000, to collect data over Antarctica. This is the second year that we have taken advantage of the relatively low demand for Enhanced Thematic Mapper Plus (ETM+) duty cycle from December to March to collect Landsat 7 data over Antarctica. This year we will concentrate on collecting scenes in ascending-mode, to allow scientists to see subtle features by contrasting the different lighting conditions between this year and the descending-mode scenes acquired last year. Dr. Robert Bindschadler, a Landsat 7 Science Team member, will lead an effort to improve the Automatic Cloud Cover Assessment (ACCA) algorithm. His results will also be shared with the Landsat Project Science Office to facilitate improvements to the ACCA software and with the International Ground Station (IGS) community when they are available.

Landsat 4/5 Archives

The USGS met with Space Imaging (SI) representatives on December 18 to discuss the transfer of SI's archives of Landsat 4/5 data. SI also asked the USGS to advise ICs, who are no longer receiving Landsat 5 data directly, to contact SI with regard to residual data rights on existing ground station archives. ICare asked to copy the Landsat 7 Program Manager, R. J. Thompson, on any correspondence with SI regarding archive data rights.

IGS Data Validation/Exchange Status

Cooperation in implementation of the Landsat 7 Data Validation Plan and Data Exchange Plan has been tremendous. The Cordoba, Argentina Ground Station is the first station to provide to the USGS raw computer-compatible data that have been successfully processed and validated as equivalent in quality to the USGS EROS Data Center's (EDC) raw computer-compatible data. The Alice Springs, Australia Ground Station is the first station to provide the USGS with Level Zero Reformatted Distribution Product (LORp) data that have been successfully processed and validated as equivalent in quality to the EDC LORp data product.

Raw Computer Compatible Data Format Control Book Release

The official Landsat 7 Raw Computer Compatible (RCC) Data Format Control Book (DFCB) was released January 1, 2001. This release documents the existing Landsat 7 RCC data format and replaces all previous versions of the Landsat 7 Computer Compatible Raw Wideband Exchange DFCB. As part of IGS data validation and exchange, the Landsat 7 Program asks all ground stations to use this updated DFCB when providing the USGS raw computer-compatible data.

The Landsat 7 Program is also planning to release an RCC DFCB update in mid-2001 to document forthcoming changes associated with the RCC data accounting file. Although these changes are expected to be minor, we will provide IGS's adequate time to accommodate them in their capture systems.

Landsat 7 Band 6 Calibration Updates

The calibration efforts of the Landsat 7 Science Team revealed an offset error in the calibration coefficients of Band 6. These offsets have been corrected through a reformulation of the calibration equation in the Image Assessment System (IAS) and the Landsat Product Generation System (LPGS). These updates directly impact users of the Landsat 7 CPFs and/or Level 1 software based on the IAS or LPGS software.

Read more about the changes at: http://edcwww.cr.usgs.gov/l7dhf/ias_folder/cal_notice_jan2001.htm. Please contact Julia Barsi at the Landsat Project Science Office (julia@ltpmail.gsfc.nasa.gov) with questions.

Landsat Data Continuity Mission (LDCM) Workshop

ICs should be aware of an upcoming Landsat Data Continuity Mission (LDCM) workshop on January 9-10, 2001, at the USGS National Center in Reston, Virginia. The workshop will be an open forum to discuss the draft LDCM Data Specifications and potential commercial opportunities. Registration information is available on the LDCM website at <http://ldcm.usgs.gov>, and ICs are encouraged to attend if possible. The LDCM Data Specification is also on-line at this website and comments on the Specification can be made on-line.

EO-1 Workshop

The first of several Earth Observing 1 (EO-1) Technology Workshops will be held on January 11, 2001, beginning at 8:30 a.m. in the USGS Auditorium in Reston, Virginia. This one-day workshop is organized to provide background on the new technologies to be flight-validated by the EO-1 mission and to discuss the various ways that these new technologies might be infused into future science missions such as LDCM. For more information on attending the EO-1 Workshop see the website (<http://ldcm.usgs.gov>; click workshops.)

Landsat 7 Technical Working Group Meeting #9

The Station Report format for the upcoming LTWG-9 meeting in Maspalomas, Spain on February 19-22, 2001, has been sent to each ground station. The deadline for reservations is approaching in January. It looks as though most of the Ground Stations will be represented.

EROS 1A Satellite Launch

On December 5, 2000, a Russian Start-1 rocket successfully launched an Israeli satellite into orbit from Russia's Far East launch facility. For more information see their website at <http://www.imagesatintl.com>.

EO-1 Status

On November 22, 2000, the EO-1 satellite was successfully launched on a Delta 2 launch vehicle from the Vandenberg Air Force Base in California. Because EO-1 is a technology demonstration mission, only about 4000 images will be acquired globally. These data will be distributed from the USGS EROS Data Center starting about January 2002. For more information see the EO-1 website at <http://eo1.gsfc.nasa.gov>.