



USGS
science for a changing world

Landsat Data Continuity Mission

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Spacecraft

GENERAL DYNAMICS ADVANCED
INFORMATION SYSTEMS

State of the Art Technology

The LDCM Operational Land Imager

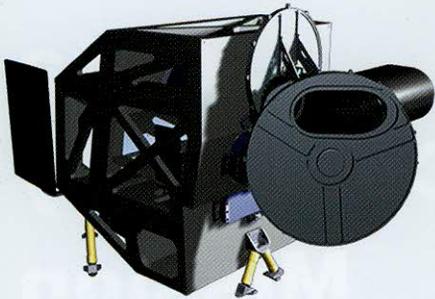
The Operational Land Imager (OLI) improves on past Landsat sensors. OLI uses a technical approach demonstrated by a sensor used on NASA's experimental EO-1 satellite.

About OLI

- Push-broom VIS/SWIR sensor
- Four mirror telescope
- 12-bit quantization

Data unmatched in quality, detail, coverage and value

The spectral, geometric, and radiometric quality of Landsat's imagery is unsurpassed, and its coverage across several key spectral bands is unique among the world's satellites. This consistently high quality is made possible by continuous improvements in technical quality of the Landsat instruments.



Operational Land Imager (OLI)

BALL AEROSPACE TECHNOLOGY CORP.

Launch Vehicle

UNITED LAUNCH ALLIANCE
ATLAS-V ROCKET



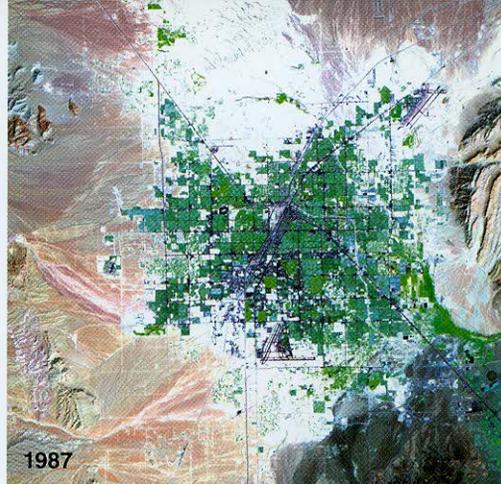
Data Record

Pixel by pixel, consistently gathering data about our planet

Consistency in data acquisition, format, geometry, spatial resolution, calibration, coverage, and spectral characteristics is critical for the continued success of the Landsat program, and forms the basis for the LDCM requirements.

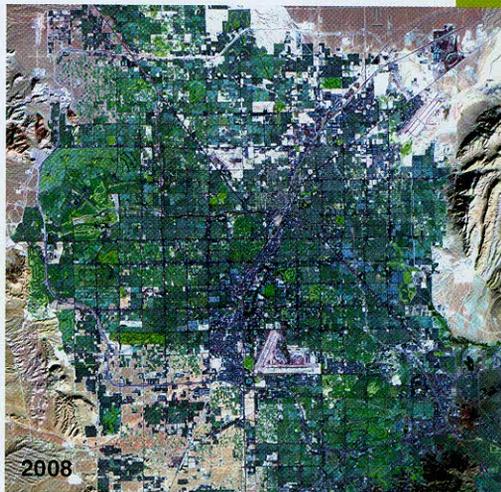
Recording the entire global land surface, every season, every year

The U.S. Landsat archive provides the world's longest, continuous global record of changes on Earth's land surface, beginning in 1972. This valuable data resource is managed by the U.S. Geological Survey Earth Resources Observation and Science (EROS) Center.



1987

Landsat data showing growth of Las Vegas between August 1987 and March 2008



2008

New USGS Data Policy

USGS will now process any Landsat archived scene selected by a user at **no charge** to a standard product recipe, and stage it for electronic retrieval. LDCM will build on the existing archive, and ensure continued availability of the entire suite of Landsat data.

Data Format

- Orthorectified
- GeoTIFF
- Universal Transverse Mercator (UTM) projection

<http://edc.usgs.gov/>

ETM+ and OLI Spectral Bands

L7 ETM+ Bands

LDCM OLI Band Requirements

L7 ETM+ Bands	LDCM OLI Band Requirements
	30 m, Coastal/Aerosol, 0.433–0.453 μm (*A) Band 1
Band 1 30 m, Blue, 0.450 - 0.515	30 m, Blue, 0.450–0.515 μm Band 2
Band 2 30 m, Green, 0.525 - 0.605	30 m, Green, 0.525–0.600 μm Band 3
Band 3 30 m, Red, 0.630 - 0.690	30 m, Red, 0.630–0.680 μm Band 4
Band 4 30 m, Near-IR, 0.775 - 0.900	30 m, Near-IR, 0.845–0.885 μm Band 5
Band 5 30 m, SWIR-1, 1.550 - 1.750	30 m, SWIR-1, 1.560–1.660 μm Band 6
Band 6 60 m, LWIR, 10.00 - 12.50	N/A (*B) N/A
Band 7 30 m, SWIR-2, 2.090 - 2.350	30 m, SWIR-2, 2.100–2.300 μm Band 7
Band 8 15 m, Pan, 0.520 - 0.900	15 m, Pan, 0.500–0.680 μm Band 8
	30 m, Cirrus, 1.360–1.390 μm (*C) Band 9

* Explanation of Differences

- A.** Coastal Band added at request of ocean color investigators requiring higher resolution of coastal waters relative to MODIS and SeaWiFS
- B.** NASA is considering the addition of a Thermal Infrared Sensor (TIRS) to the LDCM payload; two spectral bands, 120 m spatial resolution
- C.** Cirrus Band added to detect cirrus contamination in other channels

Bandwidth refinements made to avoid atmospheric absorption features (enabled by the higher signal-to-noise ratio inherent in push-broom instrument architecture)

Landsat Data Continuity Mission

Improving and expanding an unparalleled record of Earth's changing landscapes...for everyone's benefit.

NASA and USGS Partnership for Mission Excellence

LDCM will be a free-flyer satellite, acquired and launched by NASA, and thereafter operated by USGS in accordance with the December 23, 2005 directive from the U.S. Office of Science and Technology Policy.

NASA leads

- Development of space segment—spacecraft and instrument(s)
- Mission systems engineering
- Pre-launch calibration
- Launch
- In-orbit check-out of space segment

USGS leads

- Development of ground segment
- Post-launch calibration
- Satellite operations
- Data product generation
- Data archiving
- Landsat science team

More Information

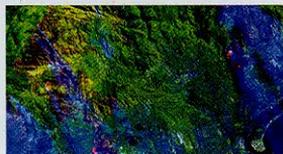
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About the cover: An EO-1 image of San Diego area fires collected on October 23, 2007.

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