

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 instruments
- 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

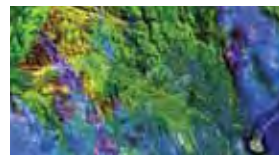
Bill Ochs, NASA LDCM Project Manager
william.r.ochs@nasa.gov

David Hair, USGS Acting LDCM Project Manager
hair@usgs.gov

Jim Irons, NASA LDCM Project Scientist
james.r.irons@nasa.gov

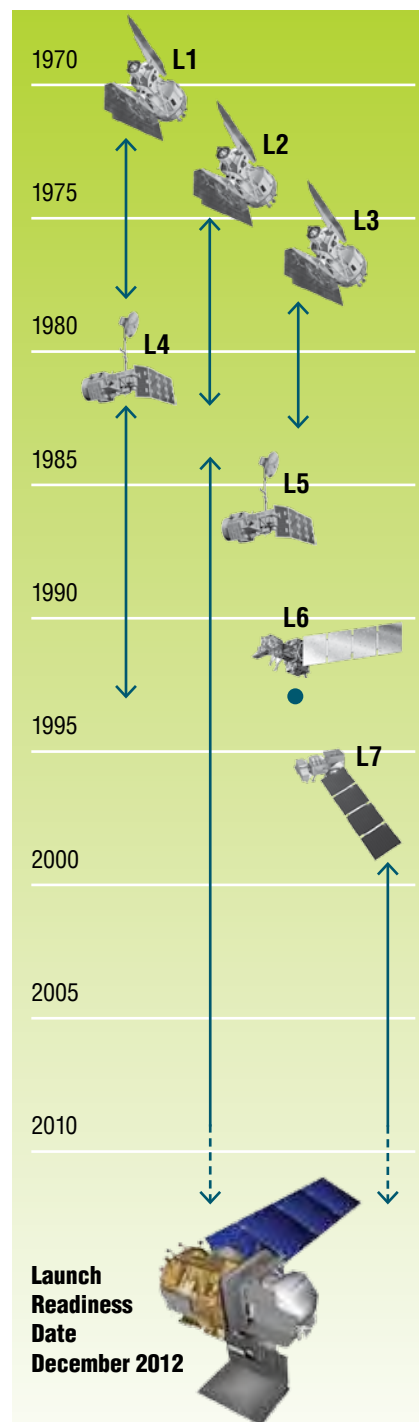
Tom Loveland, USGS Landsat Science Team Manager
loveland@usgs.gov

ldcm.nasa.gov | ldcm.usgs.gov



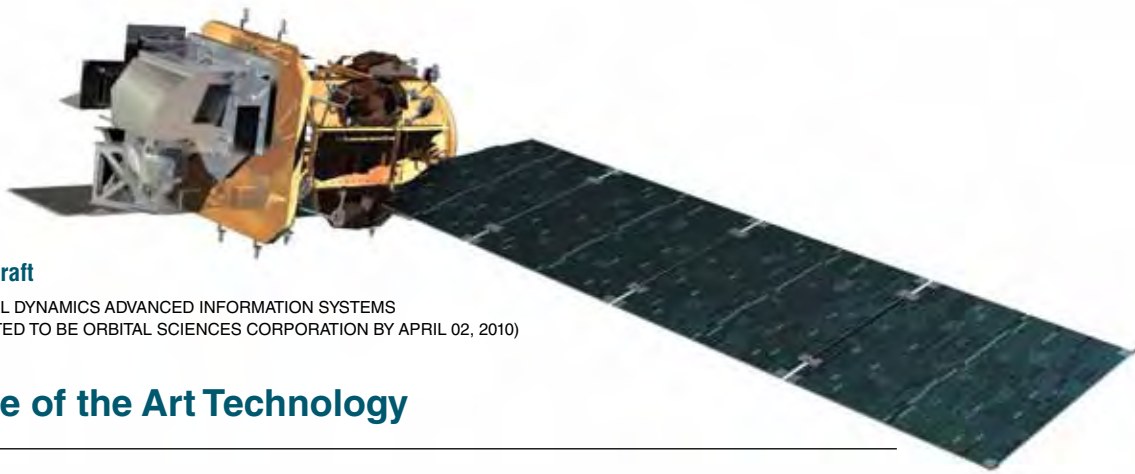
About the cover: An EO-1 image of San Diego area fires collected on October 23, 2007. North is down.

NP-2009-11-109-GSFC



Landsat Data Continuity Mission

www.nasa.gov



Spacecraft

GENERAL DYNAMICS ADVANCED INFORMATION SYSTEMS
(EXPECTED TO BE ORBITAL SCIENCES CORPORATION BY APRIL 02, 2010)

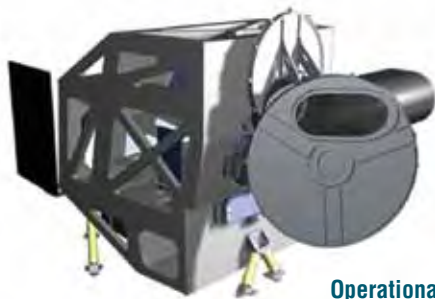
State of the Art Technology

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. OLI is a push-broom sensor with a four mirror telescope and 12-bit quantization.

The LDCM Thermal Infrared Sensor

A Thermal Infrared Sensor (TIRS) was added to the LDCM payload to continue thermal imaging and support emerging applications such as evapotranspiration rate measurements for water management. The 100 m TIRS data will be registered to the OLI data to create radiometrically, geometrically, and terrain-corrected 12-bit LDCM data products.



Operational Land Imager (OLI)

BALL AEROSPACE TECHNOLOGY CORP.



Thermal Infrared Sensor (TIRS)

GODDARD SPACE FLIGHT CENTER

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

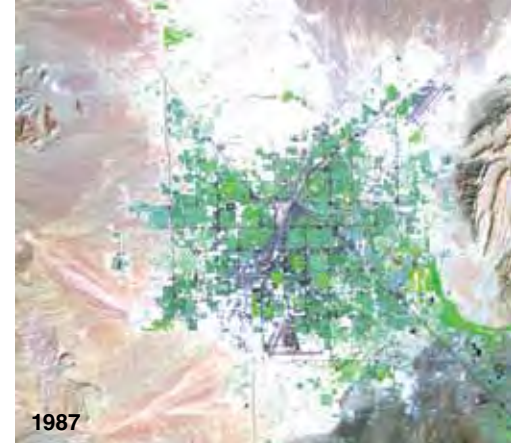
The U.S. Landsat archive provides the world's longest, continuous global record of changes on Earth's land surface, beginning in 1972. This valuable data resource is managed by the U.S. Geological Survey Earth Resources Observation and Science (EROS) Center.

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.

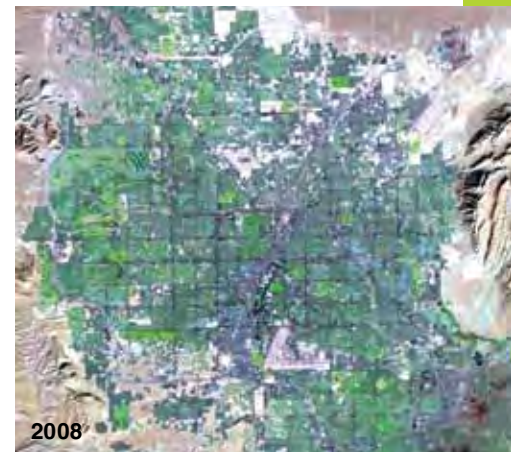
Data Format

- Orthorectified
 - GeoTIFF
 - Universal Transverse Mercator (UTM) projection
- <http://edc.usgs.gov/>



1987

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



2008

ETM+ and OLI/TIRS Spectral Bands

L7 ETM+ Bands	LDCM OLI/TIRS Band Requirements
	30 m, Coastal/Aerosol, 0.433–0.453 μm (*A) Band 1
Band 1 30 m, Blue, 0.450 - 0.515 μm	30 m, Blue, 0.450–0.515 μm Band 2
Band 2 30 m, Green, 0.525 - 0.605 μm	30 m, Green, 0.525–0.600 μm Band 3
Band 3 30 m, Red, 0.630 - 0.690 μm	30 m, Red, 0.630–0.680 μm Band 4
Band 4 30 m, Near-IR, 0.775 - 0.900 μm	30 m, Near-IR, 0.845–0.885 μm Band 5
Band 5 30 m, SWIR-1, 1.550 - 1.750 μm	30 m, SWIR-1, 1.560–1.660 μm Band 6
Band 7 30 m, SWIR-2, 2.090 - 2.350 μm	30 m, SWIR-2, 2.100–2.300 μm Band 7
Band 8 15 m, Pan, 0.520 - 0.900 μm	15 m, Pan, 0.500–0.680 μm Band 8
	30 m, Cirrus, 1.360–1.390 μm (*B) Band 9
Band 6 60 m, LWIR, 10.00–12.50 μm	100 m, LWIR-1, 10.30–11.30 μm (*C) Band 10
	100 m, LWIR-2, 11.50–12.50 μm (*C) Band 11

*** 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.** Cirrus Band added to detect cirrus contamination in other channels
 - C.** TIRS will acquire the data for these two thermal bands. The data from all 11 spectral bands will be co-registered to create an LDCM data product containing the data from both TIRS and OLI.
- Bandwidth refinements made to avoid atmospheric absorption features (enabled by the higher signal-to-noise ratio inherent in push-broom instrument architecture)