
NASA
USGS
science for a changing world
Landsat
Data Continuity Mission
FREE DATA!
Details Inside
see our
changing world
1 mi
3 mi

Landsat Delivers...

Data the World Has Learned to Trust

Pixel by pixel, Landsat satellites have consistently gathered data about our planet. Consistency in data collection, image format, geometry, spatial resolution, calibration, coverage and spectral characteristics are hallmarks of the Landsat program, and forms the basis for the LDCM requirements.

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

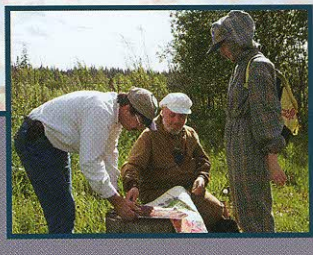
In situ measurements of reflectivity are used to calibrate Landsat.

Data for Research and App

People are using Landsat data to

- Monitor carbon in forests worldwid (http://landsat.gsfc.nasa.gov/news
- Quantify water use in agricultural f (http://landsat.gsfc.nasa.gov/news
- Monitor burned area recovery effo (http://mtbs.gov/index.html)
- Map the extent and rate of urban g region (http://www.geog.umd.edu/

...and much more. Read more at http://landsat.gsfc.nasa.gov/news/artic



The Next Landsat

Landsat Data Continuity Mission (LDCM)

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

Launch Readiness Date December 2012

LDCM, the eighth in the series of Landsat satellites, will continue and advance the collection of Landsat data with a two-sensor pa The Operational Land Imager (OLI) will collect image data for nine shortwave bands with a 30m spatial resolution (15m panchrom band). The Thermal Infrared Sensor (TIRS) will collect data for two longwave thermal bands with a 100m resolution. The TIRS da registered to OLI data to create radiometrically, geometrically and terrain-corrected 12-bit LDCM data products.

NEW and IMPROVED: LDCM will collect data for new spectral bands as well as heritage multispectral bands with refined bandwid improved radiometric performance.

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 **(*B)**	Band 4
Band 4	30 m, Near-IR, 0.775–0.900 µm	30 m, Near-IR, 0.845–0.885 µm **(*B)**	Band 5
Band 5	30 m, SWIR-1, 1.550–1.750 µm	30 m, SWIR-1, 1.560–1.660 µm **(*B)**	Band 6
Band 7	30 m, SWIR-2, 2.090–2.350 µm	30 m, SWIR-2, 2.100–2.300 µm **(*B)**	Band 7
Band 8	15 m, Pan, 0.520–0.900 µm	15 m, Pan 0.500–0.680 µm **(*B)**	Band 8
		30 m, Cirrus, 1.360–1.390 µm **(*C)**	Band 9
Band 6	60 m, LWIR, 10.00–12.50 µm	100 m, LWIR-1, 10.30–11.30 µm **(*D)**	Band 10
		100 m, LWIR-2, 11.50–12.50 µm **(*D)**	Band 11

*Explanation of Differences

A. Coastal Band added at request of ocean investigators requiring higher resolution o waters relative to MODIS and SeaWiFS.

B. Bandwidth refinements made to avoid atm absorption features (enabled by the highe noise ratio inherent in push-broom archite

C. Cirrus Band added to detect cirrus contar other channels.

D. TIRS will acquire the data for these two th bands.

lied Sciences

news-archive/news_0249.html)
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esac/urban-modeling.htm)

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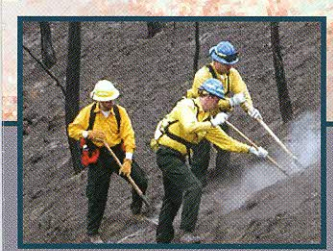
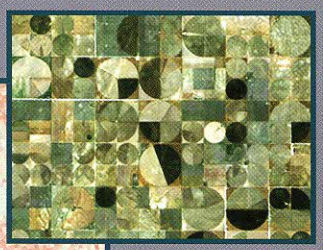
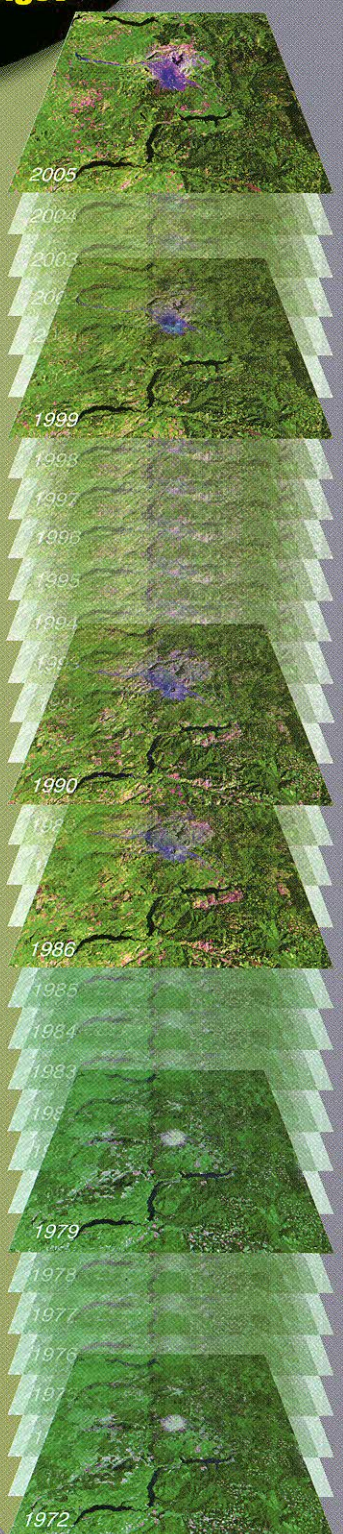


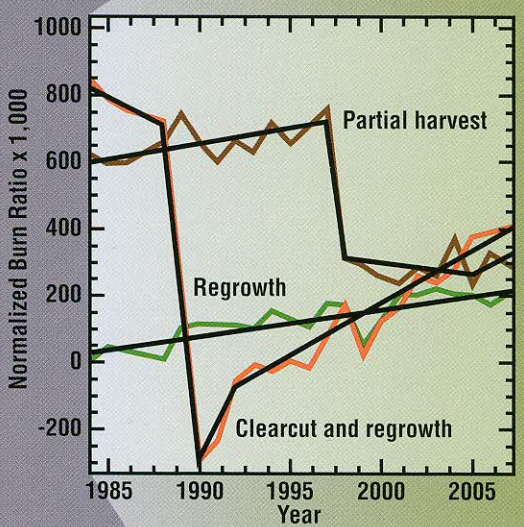


Where's the DATA?

The entire USGS Landsat data archive, dating from 1972 to present, is open **NOW** and is **FREE** to all users.

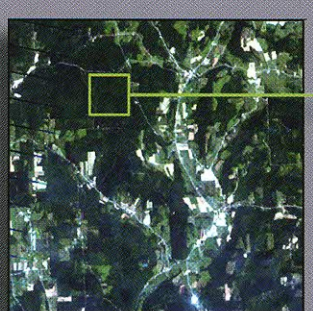
http://earthexplorer.usgs.gov



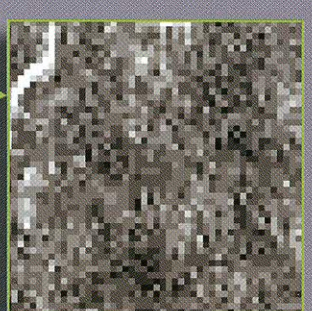


The quality and depth of the Landsat archive make it possible for detailed analysis of change over time–to follow the life of a pixel. In this graph a greenness index is used to trace the ecological history of three separate pixels in Landsat scenes captured from 1985 to 2007. Graph courtesy Robert Kennedy, Oregon State University.

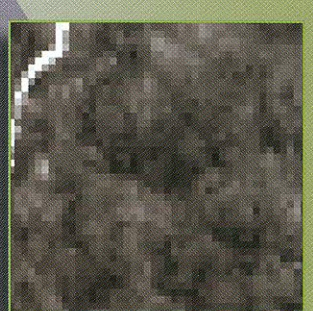
Improved Radiometry. LDCM's OLI and TIRS sensors will provide improved signal to noise ratio (SNR) radiometric performance, enabling 12-bit quantization of the data.



Landsat 7's ETM+ 3, 2, 1
All images of Upstate New York
Collected June 26, 2005

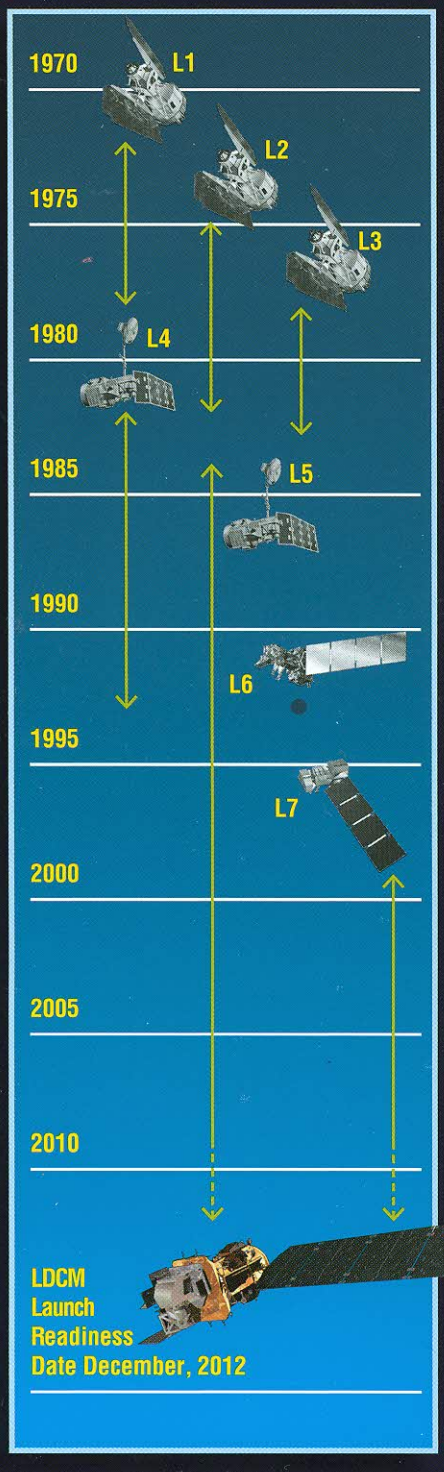


Landsat 7's ETM+ Band 3
8-bit Data 140:1 SNR



EO-1 Advanced Land Imager's Band 3
810:1 SNR

Improved signal to noise performance means more bits for better land cover characterization.



NASA and USGS partner to do the heavy lifting… *you* get the data.

NASA Leads

- Development of space segment—spacecraft and two sensors
- Mission systems engineering
- Pre-launch calibration
- Launch

USGS Leads

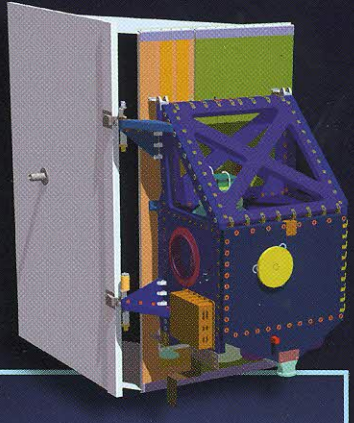
- Development of ground segment
- Post-launch calibration
- Satellite operations
- Data product generation
- Data archiving
- Science Team

More Information

http://ldcm.nasa.gov
http://landsat.usgs.gov
http://landsat.gsfc.nasa.gov

LDCM Spacecraft

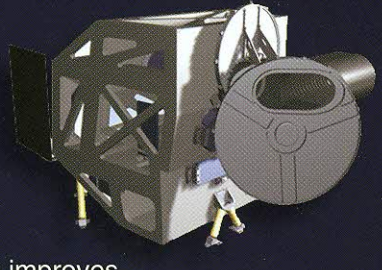
The LDCM Spacecraft is being built by Orbital Sciences Corp. under contract to NASA. This spacecraft mock-up is essentially a full scale model of the satellite, enabling engineers to check that all components seat and connect correctly. *Credit: Orbital Sciences Corporation.*



Thermal Infrared Sensor

The Thermal Infrared Sensor (TIRS) is being built at NASA Goddard Space Flight Center, to continue thermal imaging and support emerging applications such as evapotranspiration rate measurements for water management.

- Push broom sensor
- 185 km cross-track field of view



Operational Land Imager

LDCM's Operational Land Imager (OLI) improves on past Landsat sensors. OLI uses a technological approach demonstrated by the Advanced Land Imager sensor flown on NASA's experimental EO-1 satellite. The OLI is being built by Ball Aerospace Technology Corp., under contract to NASA.

- Push broom sensor
- Four mirror telescope
- 185 km cross-track field of view

Rocket

LDCM will launch aboard a United Launch Alliance Atlas-V Rocket, in December 2012.

NP-2010-11-182-GSFC

Cover Image: Landsat 7 pan-sharpened image of Sakurajima volcano, Japan February 13, 2000.