



# USGS Update on Landsat and Sustainable Land Imaging

National Geospatial Advisory Committee

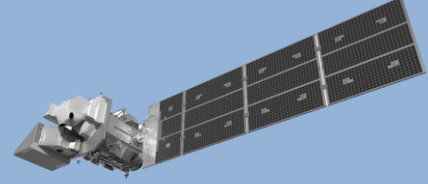
October 16, 2024

**Timothy Newman**

*Program Coordinator  
National Land Imaging Program  
U.S. Geological Survey*

# Landsat Updates – Landsat 7, 8, 9 and Landsat Next

Core Science Systems – National Land Imaging Program

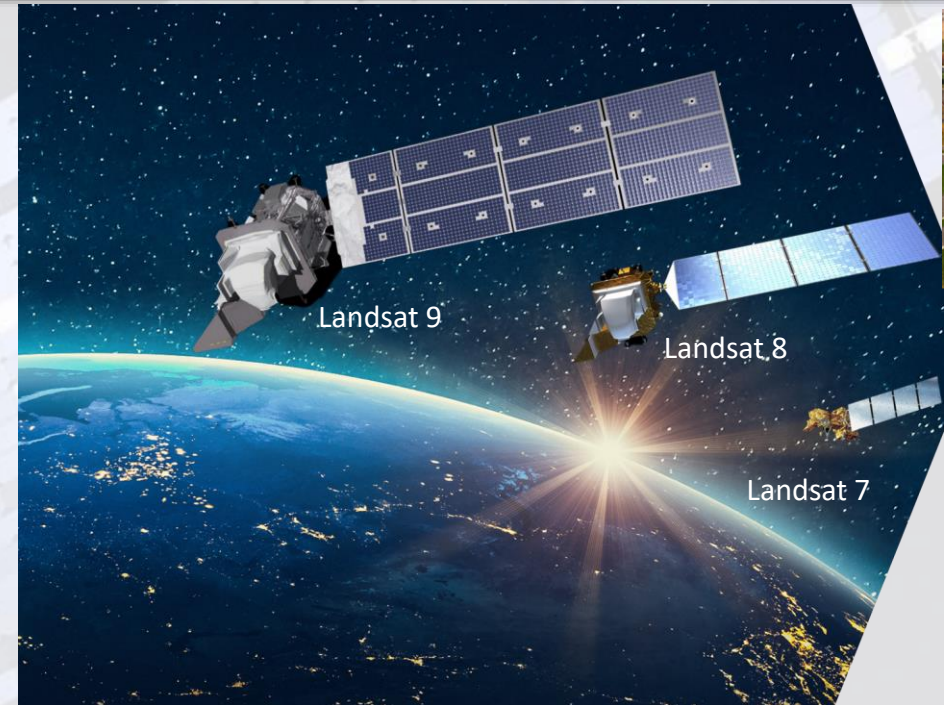


## Current Mission Updates:

- **Landsat 7:** End of science mission; NASA refueling mission cancelled.
- **Landsat 8:** Nominal operations.
- **Landsat 9:** Nominal operations.

## Future Missions: Landsat Next (LNeXt)

- NASA awarded the Landsat Next imaging instrument contract to Raytheon this summer
- NASA has indefinitely delayed release of the draft Spacecraft bus Request for Proposals (RFP).
- NASA and USGS budget uncertainty remains; Congressional Appropriations marks generally favorable to NASA and USGS, but agencies not projected to be funded at requested levels in FY 2025.



Earth Resources Observation and Science Center (EROS)

## Landsat Archive Operations

FY24 Statistics: on track for **17.6 billion** accesses via Commercial Cloud; **98 million** products downloaded; **49 thousand** terabytes managed





# Recent Landsat Next Endorsements



**Department of Agriculture** (June 21<sup>st</sup> Letter from Under Secretary of Agriculture for Research, Education and Economics and USDA Chief Scientist Jacobs-Young to Interior Principal Deputy Assistant Secretary Brain and NASA Deputy Administrator Melroy):

- *USDA agencies provided significant inputs to the design of the Landsat Next Architecture.*
- *Many USDA strategic objectives depend upon continuity and improvement of Landsat observations.*
- *Across USDA research agencies, the Landsat Next architecture will enable new analyses in the health and vigor of crops; the needs of specific fields for fertilizer, irrigation, and rotation; the impacts of and responses to prolonged drought; and agricultural census assessments and mapping.*
- *We in USDA endorse the timely development of Landsat Next as approved by the Interior-NASA Sustainable Land Imaging Joint Steering Group in February 2022 and appreciate and value our continued collaboration with the Department of the Interior and NASA.*

**Department of State** (Secretary Antony J. Blinken and Australian Foreign Minister Penny Wong signed a Joint Communiqué on the U.S.-Australia Landsat Next 2030 International Partnership Initiative Aug. 5th):

- Formally recognizes Australia as a partner in the Landsat Next satellite mission, which will provide critical insights into the Earth's land surfaces, surface waters, and coastal regions.
- Australia is expending \$300 million over the next four years to provide critical ground station infrastructure, personnel, services, and science in support of the Landsat Next mission.



# Recent Landsat Next Endorsements

## U.S. Group on Earth Observations (USGEO) Earth Observation Assessments (EOAs):

*2023 Agriculture and Forestry EOA* (released in July): Landsat Multispectral was ranked **#4** and Landsat Thermal Infrared **#9** most-impactful of over **1,000** Earth observation data sources by over **600** Subject Matter Experts (SMEs) across 8 Federal agencies.

- Landsat core applications included evaluating/monitoring agricultural conditions, irrigation, natural hazards, fuel conditions, and land management. Landsat impacted all four Ag & Forestry sub-areas including: Enhancing Food Supply; Maximizing Productivity and Conservation; Improving Resilience to Disasters; and Supporting Regulatory Requirements and Decision-making.

*2023 Climate EOA* (to be released in the fall): Landsat Multispectral and Thermal Infrared ranked very high among nearly **2,000** Earth observation data sources by over **800** SMEs across 8 Federal agencies.

- Landsat core applications included evaluating/monitoring coastal change, water resources, terrestrial ecosystems, and supporting climate assessments/land surface science. Landsat impacted all four Climate sub-areas, enhancing our understanding of 1) The Earth's climate system and the changes occurring in it; 2) Human and natural influences on the climate system; 3) Climate change effects on human and environmental systems; and 4) Facilitating societal responses to climate variability and change.



# New Landsat Value Study Released

The Native American Technology Corporation (NATECH) report “**Economic Valuation of Landsat and Landsat Next 2023**” was released by NATECH on Friday, September 13, 2024. Economists from Colorado State University and the company TerraWatch Space authored the study. The study estimated the economic benefits of Landsat imagery to users who access Landsat data through USGS Earth Explorer. USGS feature stories and other venues for communication are in progress.

## Key Highlights:

Landsat’s value to users was estimated at **\$25B** in 2023, based on the Contingent Valuation Method, an accepted economic approach for valuing non-market goods. NATECH also completed a multiple regression analysis to estimate the added value of improvements provided by Landsat Next and found that value to be approximately **\$33B**. (These figures are conservative as they do not account for the value derived from indirect users using Landsat from non-USGS government platforms such as Google, Amazon, Microsoft, Esri, etc.)



## Economic Valuation of Landsat and Landsat Next 2023

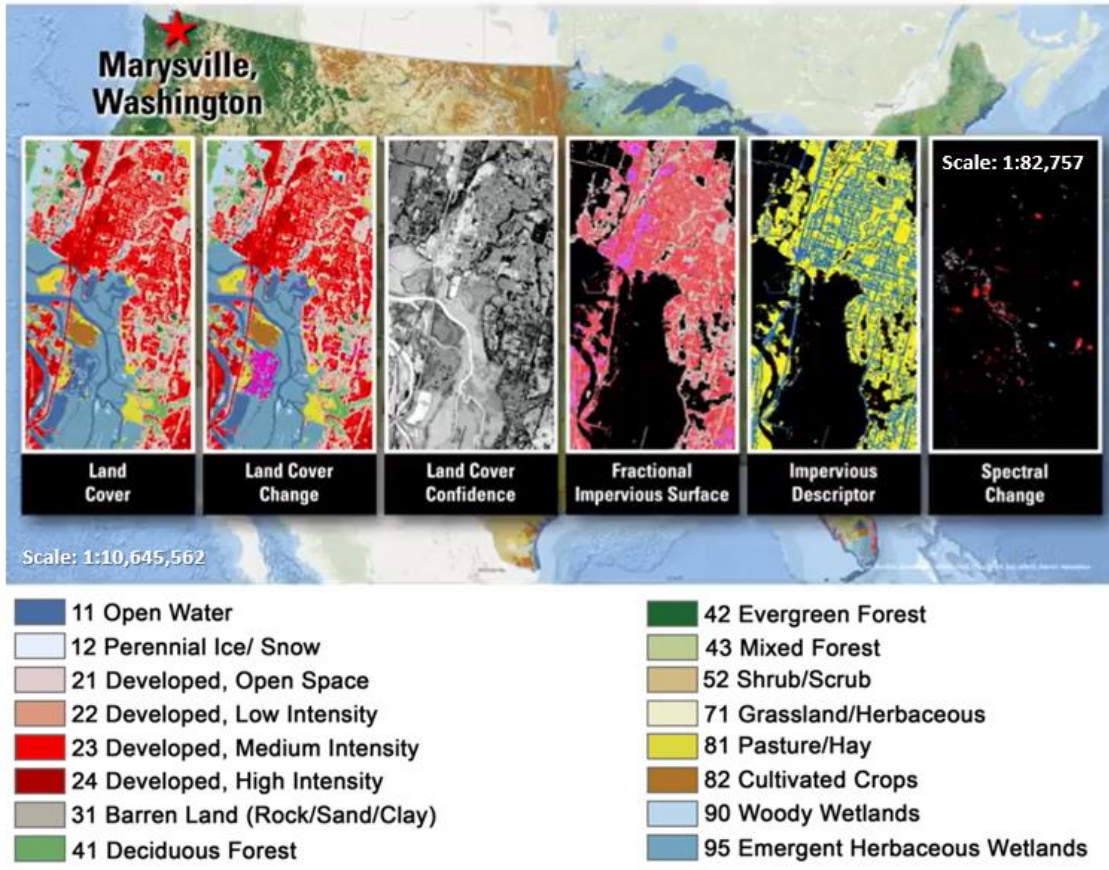


[Economic Valuation of Landsat and Landsat Next 2023](#)



# Annual National Land Cover Database (NLCD) Release

## Annual NLCD Collection 1.0: 1985 – 2023



## Annual NLCD Collection 1.0 (1985-2023)

- Planned release date: October 24<sup>th</sup>, 2024.
- Landsat-based land cover and change product.
- Cover Conterminous United States (CONUS).
- Document how America's landscape changed over the past four decades.
- Map land cover, detect land change, characterize fractional impervious surface.
- Suite of 6 land cover and land cover change products for each year from 1985-2023 at 30-m spatial resolution.
- Outreach: Public webinar, factsheet, podcast, social media, newsletter.

# Congressional Appropriations Language on Landsat Next



## Interior: National Land Imaging Program

- **House:** “The recommendation includes \$124,071,000 for the National Land Imaging Program. The Committee recognizes the need for an on-time and on-budget delivery of the Landsat Next mission and provides \$107,334,000, as requested, for Landsat Next to ensure the Service can meet the 2030 launch date” (**+\$12M above FY24 Enacted**).
- **Senate:** “The bill funds Satellite Operations at \$6,000,000 above the enacted levels for Landsat Next.” “The recommendation includes \$121,882,000 for the National Land Imaging Program, of which \$101,610,000 is for satellite operations;” (**+\$6M above FY24 Enacted**).

## NASA: Landsat and Landsat Next

- **House:** “The recommendation supports Landsat Next and directs NASA to submit a report, no later than 120 days after the enactment of this Act, that includes a plan to ensure the transition from the current Landsat spacecraft to the Landsat Next spacecraft remains on schedule and there is no disruption to the Landsat data record.”
- **Senate:** “Landsat Next.—The Committee recognizes the importance of on- time and on-budget delivery of the Landsat Next mission to ensure full data continuity with the Landsat 9 mission. The Committee provides \$150,000,000 for Landsat Next and expects to be kept apprised if any issues arise with the current schedule.”

**FY25 House & Senate Bill Language supports Landsat Next in both Interior & NASA’s budgets**



# Landsat in the News

Core Science Systems – National Land Imaging Program

## Landsat 7 Brought Jobs, Science, Art and Memories to USGS

News Feature Article:

[Michelle Bouchard](#)

Communications and Outreach

[Earth Resources Observation and Science \(EROS\) Center](#)

Email: [mbouchard@usgs.gov](mailto:mbouchard@usgs.gov)

<https://www.usgs.gov/centers/eros/news/landsat-7-brought-jobs-science-art-and-memories-usgs>

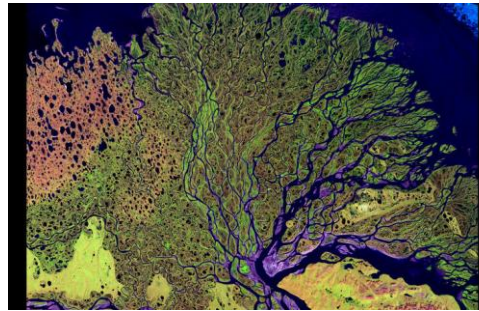
All Landsat satellites have been important to the USGS Earth Resources Observation and Science (EROS) Center. After all, storing and distributing Landsat data is the reason the EROS Center was created.

But as Landsat 7 completed its mission this year and we look back 25 years, the anticipation and excitement of the satellite's launch in 1999 nearly rivaled the first Landsat's launch in 1972.

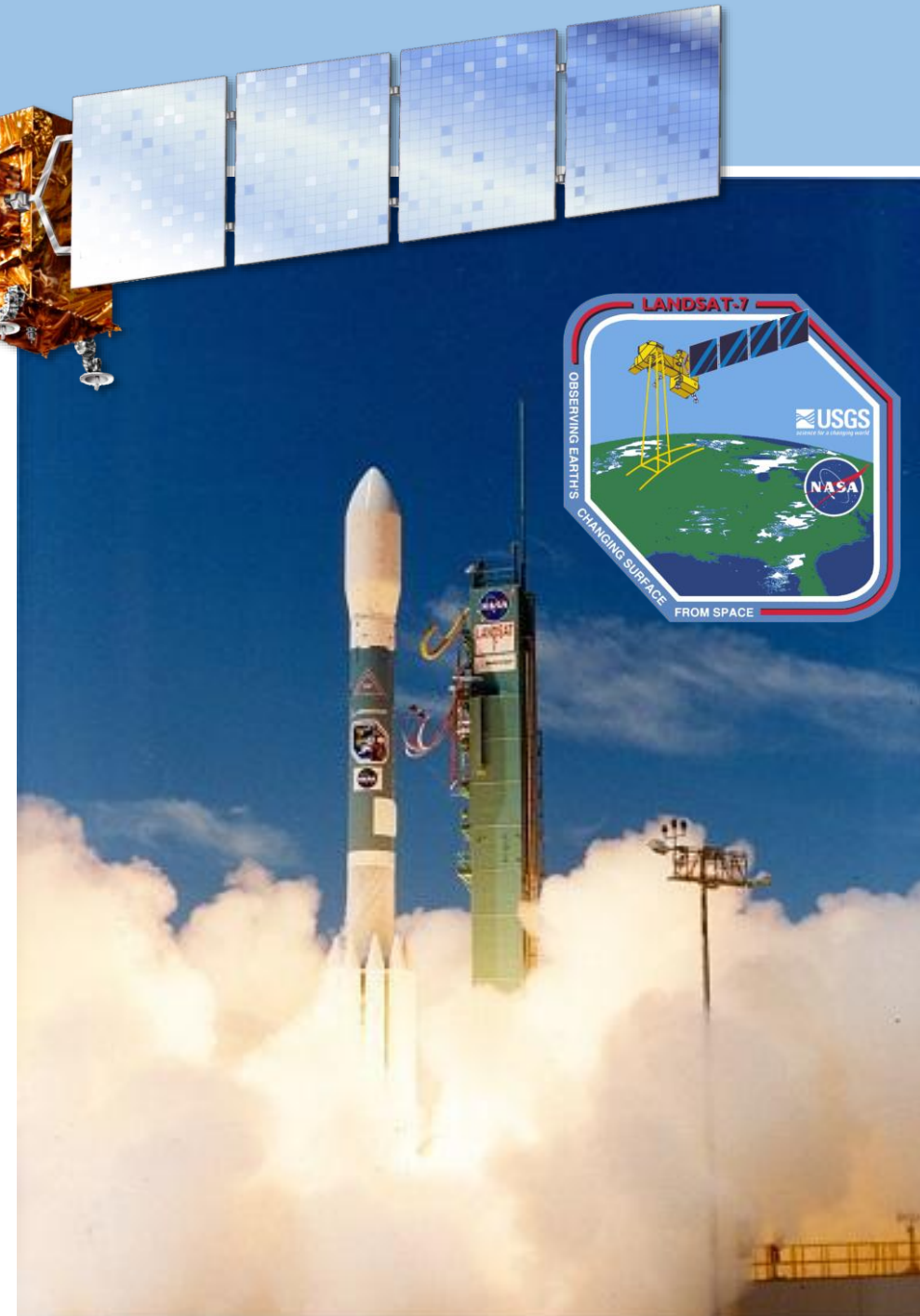
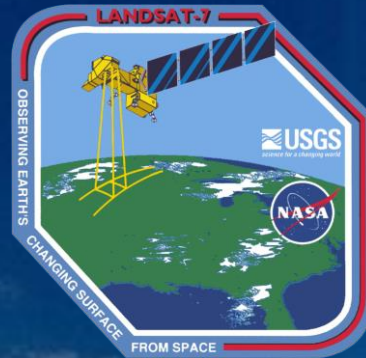
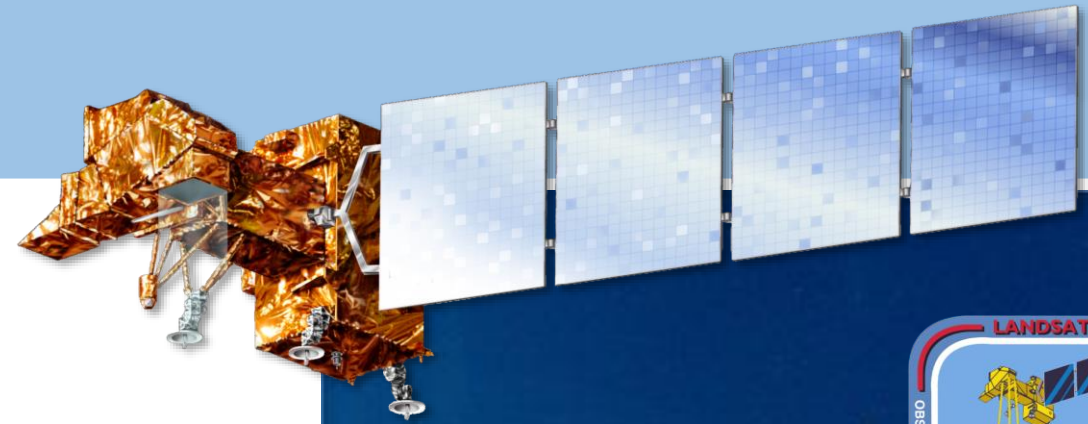
Article highlights:

- A Launch of Hope
- Data Started Rolling In
- Calibration—There's a Science and an Art to It
- Landsat 7 in the Spotlight (Earth as Art Debut)
- Harrowing Malfunction
- 'Stressful Time' at EROS
- Devoted Flight Operations Team Members
- 'It's Been Quite a Ride'

Earth as Art



Scan Line Corrector Malfunction





# Landsat in the News

## Your Name in Landsat - Make Your Own!

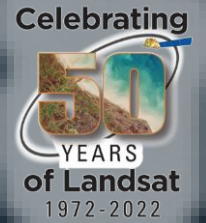
Our colleagues at NASA Landsat Communications recently unveiled an interactive application that displays letters in Landsat images! From over 400 miles in space, the sensors on Landsat satellites acquire imagery that is not only used for science investigations, but also allows for creativity, like seeing the alphabet! See what your name looks like in Landsat imagery by trying out the ["Your Name in Landsat"](#) application for yourself.



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LANDSAT spelled out using Landsat imagery. Courtesy of NASA's "Your Name in Landsat".





***Thank You!***

NASA "Landsat's Next Chapter" Video <https://svs.gsfc.nasa.gov/14262>

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