

Joint Sustainable Land Imaging (SLI) Program NASA-USGS Strategy for Transitioning Landsat to Commercial Solutions

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Definition of Success

As soon as feasible and no later than 2035, all or the majority of USGS Landsat data products are produced using commercially-provided data, which is harmonizable with the historical archive, from a robust and competitive marketplace supported by a rolling federal procurement process that maintains the value of the Landsat data record.

Introduction

This document provides an overview of the joint strategy for NASA and USGS to achieve commercial solutions for the Sustainable Land Imaging (SLI) program's Landsat mission beginning in 2026 and extending through the 2030s. This plan assumes that there will be one final government satellite hosting one LandIS instrument, known as Landsat 10.

The NASA and USGS strategy for commercialization takes a product-based approach, providing an opportunity for industry to work with USGS and NASA to address individual products instead of the entire Landsat portfolio. This will allow companies to address portions of the portfolio that best suit their capabilities and business interests. For instance, most companies that do not currently have Thermal Infrared (TIR) capability could still be able to address products which only use Visible and Near-Infrared (VNIR) measurements. This will broaden the number of companies that can participate and increase the likelihood of commercial transition and marketplace creation. It will also enable NASA to focus technology investments on those products that industry is currently not capable of addressing. By moving to a product-based approach, the agencies can leverage commercial capabilities where they already exist, foster innovation where gaps remain and ensure that the broad Landsat user community continues to receive high-quality, decision-ready products.

The strategy will be executed in phases with progressively more complex analytic product types that collectively define the scope of commercial participation and potential transition pathways. These product types include augmented products, new products, and replacement products. Augmented products will use commercial data in tandem with existing Landsat products to enhance scientific value, generally at local or regional scales, by increasing temporal revisit rate

of the existing Landsat products benefiting dynamic applications (e.g., agriculture fields impacted by floods, fire, windstorms). These product suites represent the lowest barrier to entry. New products will take advantage of commercial data to generate new geophysical variables and expand applications or enhance temporal/spatial utility beyond existing Landsat products. These new products could address high-value national needs that are not currently met by existing data and represent near-term, high-value opportunities for commercial data. Generally, they are expected to be geographically focused and therefore are more attainable for commercial data. Replacement products are those where commercial data is sufficient for replacing Landsat data, either regionally or globally. Replacement products represent the most technically demanding category, requiring industry providers to deliver data that is equivalent to Landsat data with the expected quality and consistency in time and space. These products are the desired end state of the strategy.

Breaking the strategy into phases allows NASA and USGS to identify and demonstrate the utility of value-added products that can augment key applications in the near term. This phased approach also prepares industry for progressively more complex product requirements, ultimately leading to full product replacement. Critical issues that have impeded commercial participation such as product quality, completeness, and consistency can be addressed by the Product and Technical teams on individual products before attempting universal solutions.

Phases Summary

The strategy is aligned with five distinct Phases: Quick Wins, Demonstrations, Initial Capability, Assessment, and Routine Implementation.

Quick Wins: This study phase, which is expected to last six-to-nine months in duration, is currently in-progress running through December 2026 with multiple industry partners, including existing CSDA vendors with new task orders and a new vendor under Blanket Purchase Acquisition. This phase identifies USGS products for rapid use of commercial data and industry partners capable of providing the source data. The Technical team has been stood up to commence the development of the processing workflow that continuously quality controls and evaluates commercial data via cross-calibration with Landsat 8/9 to generate select products with associated uncertainties. This team will identify technical shortfalls in commercial systems and begin addressing both calibration, validation, algorithm development, and product harmonization. Broader industry engagement is planned in September 2026 to convey the overall strategy and near-term expectations.

Demonstration Phase: This phase spans FY 2027-2028. This phase will clearly demonstrate proof of concept products using commercial data with multiple industry partners. This phase will establish the processing workflow, implement corrections to any data shortfalls, and mature cross-calibration techniques and validation protocols for commercial products to enable the generation of Landsat-grade products. Additionally, the USGS and NASA teams will work to

inform the broader industry on the commercialization strategy, business models, and identify potential industry partners which can be brought into the program to address additional USGS products. Further, technology gaps and needs will be captured in FY 2027 to initiate hardware and software development to expedite product maturation. This phase will also include developing an end-user engagement strategy to inform, prepare, and set expectations for public, academic, and private sector users of Landsat.

Initial Capability: This phase spans FY 2029-2030. During this phase, all Line of Effort teams will build on the proofs of concept and process development and USGS will move to full and open competition for commercial data to support operational production of selected USGS products. The teams will continue to work with industry to address technical shortfalls for both commercial capabilities, calibration methods and validation systems for product evaluation to ensure the maximum number of USGS products are supported. The teams will evolve the process of demonstrating new proof of concept products through incorporation of additional USGS data products integrated with commercial data.

Assessment: Assessments begin in conjunction with the Initial Capability phase to determine a) how many USGS products can be fully supported by commercial data and b) the cost-effectiveness and sustainability of the commercialization approach. This analysis provides decision makers with a clear understanding of risks and opportunities leading up to Routine Implementation.

Routine Implementation: This phase spans operational activities beginning in FY 2031 and beyond and entails USGS use of commercial data sources and ground analytics for operational USGS products.

Demonstration Phase Detail

The Demonstration Phase will span FY 2027-2028 and will focus on testing concept-level products using commercial data in collaboration with multiple industry partners. During this phase, the team will develop processing workflows that entail rigorous and continuous quality control and evaluation components using space-borne and ground-based calibration and validation assets to demonstrate the product compatibility with the Landsat archive for select products. The effort will also include outreach to industry, both to communicate the broader commercialization strategy and to bring in additional partners capable of supporting future USGS products. The engagement plan will be comprised of communicating with the user community and the distribution of products amongst early adaptors to accelerate product adoption and uptake across emerging AI and data platforms.

The Demonstration Phase will begin with the establishment of the full NASA–USGS Commercial Transition team whose core is represented in the FY 2026 Quick Wins team. Dedicated NASA and USGS projects will be formed to manage and execute the phase’s

activities. Product, Technical, and Programmatic sub-teams will also be staffed and activated, and each team will begin regular status reporting to track progress against the plan.

NASA and USGS plan to direct approximately 70% of FY 2027 funds allocated to this activity toward commercial data sources, including commercial work to enhance cross calibration techniques. The remaining 30% of funding will support interagency government teams to execute the phase's planned lines of effort as described below.

Expected FY 2027 Outcomes

1. Stand up of NASA-USGS Commercial Transition project teams.
2. Award of multiple 24-month demonstration contracts to commercial partners geared towards select USGS products and understanding costs to the government for product generation.
3. Draft workflows for processing and integration of products from individual vendors and provide public accessibility to the demonstration products.
4. Publish list of individual Landsat products and their requirements.
5. Conduct second Industry Week emphasizing business model development and developing end-user engagement strategy.
6. Identify industry technology gaps and needs.

Roles and Responsibilities (NASA and USGS partnership)

USGS and NASA will jointly support three lines of effort: Product, Technical, and Programmatic.

The Product Line of Effort, led by USGS, focuses on working directly with industry to identify where commercial data can augment or replace existing sources within the Landsat product suite. This team also evaluates opportunities for creating new, high value products that leverage commercial capabilities to meet national needs. In partnership with vendors, the Product team will define and manage source data flows, develop or refine algorithms required for integrating diverse datasets, generate product requirements, identify an agreed-upon target spatial resolution for commercial products similar to Landsat-10, support assessing the quality and consistency of demonstration products against Landsat product, establish the processes needed for generating and releasing products for users, and broadly engage early adopters to support multi-source data analysis, analytics, and readiness for AI uptake.

The Technical Line of Effort, led by NASA, is responsible for developing and executing a process to formulate, implement, test, and verify the data processing pipeline that constantly verifies incoming data and calibrates, controls, processes, and validates them via multiple techniques across diverse geographic conditions and time periods. The output of these workflows feed into USGS-provisioned algorithms to create higher level products. These robust workflows will inherently support integration with the equivalent Landsat-derived products, streamlining the blending of downstream products with the Landsat archive. Because commercial systems

evolve rapidly, the Technical team's evaluation process must adapt while maintaining the integrity and scientific quality of USGS data products. This workflow will be developed in an open, transparent manner, and will be published for broader industry use and testing. In addition, the Technical team will collaborate with industry to identify and implement system improvements necessary for meeting requirements associated with additional products that are currently the most challenging to generate (e.g., water quality products).

Programmatic Team (NASA and USGS Co-Led)

The Programmatic Line of Effort, jointly led by USGS and NASA, will work with industry to define procurement models for commercial data and explore solutions for ensuring that USGS products continue to be freely distributed to the public. The Programmatic Team will work with industry to establish affordable and sustainable business models for prospective commercial providers to work with USGS and NASA. Finally, the Programmatic Team will establish a mechanism to allow operational procurement of commercial data sources for products.

In FY 2027, the Programmatic team will award 24-month Demonstration contracts to multiple commercial Earth observation vendors. These contracts will demonstrate industry's required budget for generating Landsat-like products and test the full viability of commercial data for select USGS products through task orders covering data procurement, technology and product development, and workflow implementation and testing. The team will use NASA's existing CSDA Indefinite Delivery/Indefinite Quantity contract as the primary mechanism, adding new industry partners as needed to satisfy program needs (e.g., advance product evolution). While available funding will ultimately limit the number of participating vendors, the objective is to involve as many qualified partners as possible. The Demonstration contracts are intended to validate the overarching strategy by enabling initial industry cost analysis, bulk data procurement, and the generation of commercially augmented products that meet USGS standards.

Also, in FY 2027, the Programmatic team will continue outreach to the broader industry to refine and communicate the commercialization strategy and the long-term vision for a healthy Earth Observing (EO) marketplace. A second Industry Week event, along with one-on-one sessions will be held to collaborate with vendors on a business model for commercial data procurement and to address challenges to affordability, sustainability, and potential implications of the Landsat free and open data policy. Working jointly with the Product and Technical team, the Programmatic team will publish a detailed list of Landsat products and their requirements, organized by frequency, accuracy, and geographic scope. This list will give industry clear insight into the end-state the government aims to achieve. Using this framework, the Programmatic team will work with industry to identify partnership and investment pathways that enable commercial expansion into additional product areas. Internally, this Landsat product list will serve as a metric to track progress against strategic goals.

Throughout FY 2027 and FY 2028, the Programmatic team will collaborate with industry to establish cost models for acquiring commercial data. Analysis will be conducted to inform future acquisition decisions and to guide formulation of strategies for subsequent phases.

Finally, in FY 2028, the Programmatic team will develop the acquisition plan for the Initial Capability Phase. This plan is intended to support a full and open competition for commercial data supporting select Landsat products. To communicate expectations and solicit final industry input, the Programmatic team will host a third Industry Week event in FY 2028 focused on the Initial Implementation Phase.

Product Team (USGS-Led)

In FY 2026, the Product team identified the initial suite of USGS augmentation products as part of the overall team's quick win phase and transition to demonstration activities. These products optimize the balance among current commercial capabilities in the VNIR and Shortwave Infrared (SWIR) regions, the maturity of product algorithms, and specific user requirements (e.g., floods, wildfires).

- **Near Shore Bathymetry:** Evaluates coastal hazards and guides the management of coastal communities, infrastructure, agriculture, and ecosystems affected by storms and other nearshore changes. Benefits from increased temporal revisit and spatial coverage. Examples of stakeholders that use this product include: Department of War, Office of Naval Research, NOAA, and USGS, as well as supply chain and fisheries industries.
- **Burned Area and Burn Severity:** Targets pre-fire planning, active fire detection, and post-fire monitoring. Supports wildfire resilience, restoration priorities, and coordinated post-fire management actions. Benefits from increased temporal revisit. Examples of stakeholders that use this product include: Bureau of Land Management, U. S. Department of Agriculture, State and County Fire Departments, USGS, private and local insurance, asset management, utilities, and other industry users.
- **Surface Water Extent:** Supports detection of rapid hydrological changes more accurately, monitoring dynamic water bodies, and support faster, more informed decision making across environmental management, disaster response, and long-term water resource planning. Benefits from increased temporal revisit and spatial resolution. Examples of stakeholders that use this product include: Bureau of Land Management, National Geospatial-Intelligence Agency, U. S. Department of Agriculture, NASA, NOAA, private and local insurance, finance, utilities, energy, and many other sectors.

Furthermore, in FY 2027 the Product team will explore additional product opportunities, including Evapotranspiration, Invasive Species – Fire Fuels, Crop Residue Detection, Vegetation Indices, Land Cover Classification, Snow and Ice Extent, and Impervious Surfaces. These product types will expand use of commercial data sources, including TIR and Hyperspectral observations.

The Product team will support the Programmatic team in awarding the Demonstration contracts and will establish the product-specific contract requirements for selected USGS products. Following award, the Product team will work directly with the commercial awardees to demonstrate the full viability of using commercial data for these products. This will include helping industry partners establish data flows, develop or adjust algorithms for integrated products, and evaluate harmonized commercial-Landsat products, providing a full demonstration of the overall strategy and enhanced value.

The Product team will also support drafting end-user engagement strategies to accelerate the use of integrated public-private products for new scientific discoveries to enable gold standard science and incorporation into existing and emerging decision-making processes that currently depend on Landsat products.

Throughout FY 2027 and FY 2028, the Product team will evaluate the products delivered through these demonstrations to assess their utility and performance. Working collaboratively with the Technical team, they will identify any shortfalls or gaps and determine whether solutions should be implemented through contractor systems or government-developed algorithms.

In parallel, the Product team will develop a comprehensive list of Landsat products and document their individual requirements, including frequency, accuracy, precision, and geographic scope. They will also define augmentation requirements for applicable products and prioritize measurement attributes to guide the SLI vendor acquisition strategy. For example, if certain user needs require rapid revisit (daily or sub-daily), these needs will be correlated with the Landsat spectral bands most critical for commercial rapid-revisit observations. Similarly, the team will analyze high-resolution commercial data to define augmentation requirements such as spatial detail or simultaneity of measurement. Ultimately, in collaboration with the Technical team, the Product team will provide the spatial, spectral, and metadata requirements to streamline the usability of integrated Landsat-commercial products in modern AI systems. This activity will include coordination with the Technical team that will assess the need for future ground-based Cal/Val measurements.

The Product team will also collaborate with awardees to evaluate new product concepts that could be generated from commercial data. They will share these concepts with the Landsat user community for evaluation and will develop a structured process to determine their utility. This work will help identify technology gaps that may require further support—potentially including enhancements to commercial imaging instruments or new smart-constellation capabilities.

Finally, in FY 2028, the Product team will transition to supporting the Programmatic team in developing the acquisition plan for the Initial Capability Phase. As part of this effort, they will define the product requirements for USGS products to be included in the first full and open competition.

Technical Team (NASA-Led)

In FY 2027, the Technical team will support the Programmatic team during the award of the Demonstration contracts. Working closely with the Product team, the Technical team will establish end-to-end workflows for each vendor, covering data ingestion, quality control, calibration, correction, validation, and uncertainty estimation. These workflows will be tailored to individual products and vendor architectures and will differ for land versus water applications, as well as for the VNIR, SWIR) and TIR regions. Each workflow will include an automated, operational cross-calibration and validation system, providing near-real-time data quality assessment and detailed characterization of commercial data capabilities. Following a successful demonstration, the team will begin work on an adaptive and universal workflow through which all commercial data can be processed with their attributed uncertainties. The team will work closely with the Product team to develop metadata and data provenance standards and communicate them to industry through the Programmatic team.

The Technical team will develop and implement workflows to ensure that commercial data remains consistent and accurate over the life of each contract. This process will include frequent cross-calibration of commercial data against Landsat, other institutional missions (e.g., Sentinel-2/3), and ground-based reference measurements. Through this analysis, the team will establish the required cross-calibration cadence for commercial assets to better inform any future role for the spare LandIS instruments in supporting commercially sourced products. The team will also assess existing ground validation sites to identify shortfalls in current product evaluation methods and ensure compatibility and harmonization with the legacy Landsat archive. In close collaboration with the Product team, the team will investigate the requirements for ground-based Cal/Val data, develop standards and measurement protocols, and demonstrate the utility of such measurements in support of future operationalization of such an infrastructure.

Through industry engagements in FY 2026 and FY 2027, the Technical team identifies and captures necessary technology gaps and needs (calibration facilities, pre-launch characterization, uncooled detectors) and makes recommendations to NASA to address industry needs and aid them to rapidly meet the goals and objectives of the SLI commercialization transition.

Finally, in FY 2028, the Technical team will support the Programmatic team in developing the acquisition plan for the Initial Capability Phase. As part of this work, the team will work with the marketplace to define an extended suite of product requirements for product evaluation and for any technical improvements required of commercial systems to be included under contract.

Conclusion

The FY 2027–2028 Demonstration Phase represents a pivotal step in transitioning Sustainable Land Imaging toward a commercially enabled future. By establishing the NASA–USGS Commercial Transition project teams and awarding multiple 24-month Demonstration contracts,

the agencies will demonstrate the viability of integrating commercial source data into select USGS products. This phase is designed not only to validate high-value products but also to explore technical shortfalls, refine calibration and validation processes, prepare user communities to expedite adoption, and demonstrate the algorithms and data integration workflows required to reliably merge heterogeneous commercial and Landsat datasets. Through these activities, the Demonstration Phase lays the technical and operational foundation necessary for future broader-scale use of commercial data sources.

As the Product, Technical, and Programmatic teams execute their responsibilities, FY2027 will deliver several critical outcomes that shape the program's trajectory. These include the activation of the full transition team, publication of a detailed list of current Landsat products and their attributes, development of processing workflows, initial capability assessments of commercial partners, technology gap and need analysis, establishment of Cal/Val methods and standards, and continued engagement with the broader industry through a second Industry Week focused on marketplace and business model development. Together, these outcomes will provide government and industry with a shared, transparent understanding of product requirements, performance expectations, and partnership pathways.

By the end of the Demonstration Phase, NASA and USGS will have generated operational evidence, cost insights, and industry feedback needed to inform the Initial Capability acquisition plan. The agencies will have validated commercial data utility across multiple product types and identified opportunities for technological investment and system improvements. These results will position NASA and USGS to move confidently into a competitive procurement environment, advancing a long-term strategy that maintains Landsat continuity while unlocking new commercial capacity, accelerating innovation, driving the economy, and expanding national access to high-value land imaging products.