

# REQUEST FOR INFORMATION FOR NASA'S SUSTAINABLE LAND IMAGING ARCHITECTURE STUDY

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## General Information

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Response Date:	October 18, 2013
Recovery and Reinvestment Act Action?:	NO
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Set-Aside Code:	N/A
Internet Address:	<a href="http://espd.gsfc.nasa.gov/landimagingstudy/">http://espd.gsfc.nasa.gov/landimagingstudy/</a>

## Office Address

NASA/Goddard Space Flight Center, NASA Headquarters Acquisition Branch, Code 210.H, Greenbelt, MD 20771

## Description

REQUEST FOR INFORMATION (RFI): THIS IS \*NOT\* A REQUEST FOR PROPOSAL, QUOTATION, OR INVITATION TO BID NOTICE.

## Purpose

The National Aeronautics and Space Administration (NASA) is seeking information on system concepts and innovative approaches for its Sustainable Land Imaging Architecture study.

## Background

For the past 41 years, Landsat satellites and associated U.S. Government ground processing, distribution, and archiving systems have acquired and made available global, moderate-resolution (5-120m), multispectral measurements of land and coastal regions, providing humankind's longest record of our planet from space. NASA and the U.S. Geological Survey (USGS) of the Department of the Interior (DOI) fully recognize that this information is a national asset, providing an important and unique capability

that benefits a broad community, including Federal, state, and local governments; global change science, academia, and the private sector. Landsat data provide a consistent and reliable foundation for research on land use change, forest health, and carbon inventories, and changes to our environment, climate, and natural resources. Additionally, the free and open availability of the Landsat data enables the measurements to be used routinely by decision makers both inside and outside the Government, for a wide range of natural resource issues, including water resource management, wildfire response, agricultural productivity, rangeland management, and the effects of climate change. More information on Landsat can be found at <http://landsat.gsfc.nasa.gov/> and <http://landsat.usgs.gov/>.

### **Current Spaceborne Missions**

The USGS currently operates two Government-owned spacecraft, Landsats 7 and 8, both developed by NASA for USGS. Each spacecraft is in a Sun synchronous, 705 km orbit, with an equatorial crossing time of 10:00 a.m. + or – 15 minutes, and (nadir) revisit of 16 days. Landsat 7 was launched in April 1999. It has been flying with degraded Enhanced Thermal Mapper Plus performance since May 2003 and is expected to be decommissioned in 2017. Landsat 8, formerly known as the Landsat Data Continuity Mission (LDCM), was launched in February 2013 and has a mission design life of five years for both the spacecraft and the primary instrument, the Operational Land Imager (OLI). The Thermal Infrared Sensor (TIRS) has a design life of three years. The Landsat-8 Observatory is carrying sufficient fuel for a mission duration of more than 10 years.

### **Beyond Landsat 8**

Recognizing the importance, demonstrated utility, and future potential value of multidecadal, continuous, global measurements of our planet's land cover properties, the U.S. will design and implement a robust land imaging system to ensure that necessary data are collected, processed into useful and efficient information products, and are archived and broadly distributed for use by the wide range of interested communities. This spaceborne system may be combined with alternative sources for Landsat-quality data, either procured through commercial approaches or through partnership agreements, as they become available.

The sustainable land imaging system's major objectives include:

- Collecting and archiving moderate-resolution spectral image data, including thermal, affording seasonal, substantially cloud-free, coverage of the global landmass for a continuous period of no less than 20 years;
- Ensuring that new data acquired, once integrated into the National Satellite Land Remote Sensing Data Archive (NSLRSDA), are sufficiently consistent with data from earlier Landsat missions in terms of calibration, coverage characteristics, spectral and spatial characteristics, output product quality and data availability, to enable the detection and quantitative characterization of changes on the global land surface over multidecadal periods;

- Free and Open access to a continuous data stream of moderate resolution data of the quality and frequency of acquisition consistent with the 40 plus years of Landsat Observations, supporting development and dissemination of a wide range of data products on a nondiscriminatory basis and at no cost to the users.

In Fiscal Year 2014, NASA will lead, and the USGS will support, the design of a system architecture for a sustainable, realistic, and affordable program that will provide future land imaging data compatible with the existing Landsat data record and specifically as consistent with the characteristics of the data stream currently produced by Landsat-8, as practical. The agencies will cooperate in the establishment of a sustainable Land Imaging Program, including development, launch, and operation of spaceborne assets and their associated ground systems. The agencies will also cooperate in the planning and other preparations for continuing the acquisition and distribution of moderate resolution spectral data, as required, in the post Landsat-8 era. The NASA budget for the design and implementation of this sustainable land imaging architecture is specified in the President's FY 2014 Budget, submitted to Congress on April 10, 2013.

NASA will lead the system design study in close collaboration with the USGS. This study will be informed by existing knowledge of current and desired capabilities, as well as the responses to this RFI. The aim of the study will be to define a programmatically sustainable system that balances measurement capability, likelihood of data continuity (minimizing risks of gaps to the extent possible), and cost/affordability. Technology infusion over the lifetime of the program will be considered as a feature of the long-term sustainable program.

### **Request for Information**

NASA is seeking information on system concepts and innovative approaches for its Sustainable Land Imaging Architecture study, including a range of solutions for large and small dedicated spacecraft, formation flying, hosted instruments, and integration of other land imaging data sets, as well as possible international and private sector collaborations. NASA also seeks information on and will give careful consideration to current and future planned ground system capabilities, such as those provided by the established USGS Earth Resources Observation and Science (EROS) Center. RFI responses should recognize that lowering the system's overall cost to the nation is an important goal, and that implementing a system that stays within the allocated budget is an essential programmatic requirement for the U.S. Government. NASA is looking for complete system architecture solutions addressing all of the observational and data parameters, as specified in the reference parameters below. NASA also welcomes concepts that may address portions of those parameters and their performance capabilities. NASA is also interested in evolutionary development ideas that could lead to a significantly different approach in later years.

### **Reference Parameters**

Given a goal of Landsat data continuity for a future land imaging system architecture, the specifications applied to the design and implementation of the most recent Landsat mission, the Landsat Data Continuity Mission (LDCM), now known as Landsat 8, are

provided as an informational reference document for the purposes of this RFI (see <http://espd.gsfc.nasa.gov/landimagingstudy/>). Compatibility with previous Landsat missions, as well as consistency with the characteristics of the data stream currently produced by Landsat-8, as practical, are overarching goals for the outcome of this Sustainable Land Imaging Architecture Study. LDCM performance and characteristics were specified in terms of spatial and temporal geographic coverage, spectral bands, spatial resolution, radiometric performance, radiometric accuracy, radiometric dynamic range, radiometric response uniformity and temporal stability, bright target response, polarization sensitivity, and image geometry and geodetic location accuracy.

## **RFI Response Content**

The RFI response should include the following information:

1. Organization information: Organization name and address, point-of-contact name, E-mail address, phone number.
2. Abstract: Provide a brief summary of the system concept or participatory engagement approach.
3. System concept: Describe the system concept and functions, how it addresses the objectives and requirements in this RFI, and its maturity (Technology Readiness Level) both at present and projected with maturation plan at the time of implementation (if for a future capability).
4. Development approach: Outline the approach and timeline for developing and testing the system concept.
5. Performance Capability: An addendum to this RFI at <http://espd.gsfc.nasa.gov/landimagingstudy/> provides a synopsis of LDCM science-mission-level specifications as potential reference parameters for RFI responses. In this regard, RFI responses should compare the capabilities and characteristics of future land imaging system concepts to the reference parameters above. For example, responses should identify areas where the system concept will provide capabilities closely comparable to the reference parameters, those areas where the system concept will offer enhancements or improvements relative to the reference parameters, and those areas where the system concept departs from the reference parameters.
6. Calibration: Describe the methods used or planned for providing calibrated data (i.e., how is data quality maintained), and validating that the data meet specifications.
7. Technology Evolution or Infusion: Describe the aspects of the system concept that will evolve over the lifetime of the program and how that technology will be infused in the described mission architecture.
8. System Cost Estimate: Provide an estimate of the cost to build, implement, and operate the system concept with accompanying assumptions and rationale (for reference purposes only).

Responses are limited to no more than 20 pages, and should be submitted via E-mail by October 18, 2013, at 5 PM Eastern Time to the Point of Contact listed below. The

subject line of the submission should be "RFI for Sustainable Land Imaging Architecture Study" and attachments should be in PDF format. Files should not be greater than 8MB in size. The information is requested for planning purposes only, subject to FAR Clause 52.215-3, entitled "Solicitation for Information for Planning Purposes." Only material suitable for full and open distribution shall be submitted and submittals shall be considered approved by the providing organization to be suitable for full and open distribution. No proprietary, export controlled, classified, or sensitive material should be provided in either abstracts or presentations. Submittals identified as containing such material shall be destroyed and not further considered.

This RFI is open to all types of organizations, including U.S. industry, universities, nonprofit organizations, NASA Centers, Federally Funded Research and Development Centers, other U. S. Government agencies, and international organizations.

It is emphasized that this RFI is for planning and information purposes only and is NOT to be construed as a commitment by the Government to enter into a contractual agreement, nor will the Government pay for information solicited. If NASA decides to proceed with a new procurement or announcement, NASA will synopsise its intent on FedBizOpps.

No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released, it will be synopsized in FedBizOpps and on the NASA Acquisition Internet Service. It is the interested party's responsibility to monitor these sites for the release of any solicitation or synopsis.

All questions about the RFI shall be directed by E-mail to the Point of Contact listed below.

### **Point of Contact**

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