To: Robert DeSawal; Gene Thorley; Mark Shasby; Business Council; SPPD; David Kirtland;
From: Lawrence Pettinger
Subject: Fwd: USGS partners with NASA on Landsat Data Buy RFI
CC:
Date Sent: Wednesday, July 7, 1999 12:19 PM

As you may know, NASA recently asked USGS to join in issuing a Request for Information (RFI) for a Landsat Continuity Mission. This RFI requests the private sector to provide information about their interest in providing Landsat-like data through a commercial "data buy" that would extend the record of Landsat data beyond Landsat 7, which will become operational next week. Bruce Quirk, EROS Data Center, and I have been the primary USGS representatives who worked with NASA to draft this RFI.

By participating in the RFI, USGS expects to be an active participant in the determination of the approach to be taken for a Landsat-7 follow-on. While the Congress has recommended that a commercial approach (if feasible) have first priority, we hope that the other options identified in the Land Remote Sensing Policy Act of 1992 [government-private partnership, government-built and-operated system (the Landsat-7 model), and an international consortium] be studied thoroughly as well.

The RFI was released on July 6 (see URL in attached message) and responses are due on August 20. Please share this message with interested colleagues.

Larry

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LANDSAT CONTINUITY MISSION (LCM)

General Information

Solicitation Number: N/A
NAIS Posted Date: Jul 06, 1999
CBDNet Posted Date: Jul 06, 1999
Response Date: Aug 20, 1999
Classification Code: 99 -- Miscellaneous

Contracting Office Address

NASA Procurement Office, Code DAOO, Stennis Space Center (SSC), MS 39529-6000

Description

SOURCES SOUGHT -- THIS IS NOT A NOTICE OF SOLICITATION ISSUANCE

NASA/SSC is hereby soliciting information for potential sources for Landsat Continuity Mission via the Purchase of Data by National Aeronautics and Space Administration and the U.S. Geological Survey/Department of the Interior. This Request for Information (RFI) is being issued by the Earth Science Enterprise of the National Aeronautics and Space Administration (NASA) and the U.S. Geological Survey (USGS) of the Department of the Interior to investigate the purchase of science-quality data from commercial sources. This RFI seeks information about potential private (i.e., non-government) sources of Landsat-type data and about the rough order-of-magnitude costs for purchasing such data. These Landsat-type data are needed to extend the record of repetitive data from Landsats 1-5 and that will soon be acquired by Landsat-7. All Landsat data are archived and distributed by the USGS. The USGS and NASA will use information from this RFI for program planning and budgeting purposes only. However, future procurement activities may result from this fact-finding exercise.

The Landsat Continuity Mission is a component of the Landsat program being conducted jointly by NASA and USGS. The goals of the Landsat Continuity Mission are in keeping with the Landsat programmatic goals stated in the Land Remote Sensing Policy Act of 1992 and the Commercial Space Act of 1998. This policy requires the Landsat program to provide data into the future that are sufficiently consistent with previous Landsat data to allow the detection and quantitative characterization of changes in/on the land surface. Implementation of a Landsat Continuity Mission is expected to begin in Fiscal Year 2001, predicated upon the new source of data becoming available approximately six years after the beginning of the operational phase of Landsat-7 during the summer of 1999. The preferred approach is to purchase data, as required, from a qualified private vendor. If a qualified vendor cannot be identified, other approaches will be considered including a government-industry partnership, a government-built and government-operated system following the Landsat-7 model, and a government-international cooperative program. A single implementation approach will be chosen in 2001.

GENERAL REQUIREMENTS: The Landsat Program requirement for systematic global land cover and land cover change data drives the overall scope of this data acquisition. Many requirements of the other government agencies will be met by the data acquired to satisfy this baseline requirement. This requirement supports the U.S. Global Change Research Program (by providing the satellite data needed for the study of global environmental change) and the needs of the International Geosphere-Biosphere Program. No single U.S. Government agency or nation could purchase or analyze the entire global time series of land cover data, but rather it is expected that the international global change research community will address this challenge together with individual agencies and/or nations bringing their resources to the task. An archive of seasonally-acquired global land imagery is needed for such an international community to draw upon to address global change questions. Thus, these data must be shared with the international community and readily exchanged from user to user without undue restrictions. This requirement for sharing data is necessary for reviewing, assessing, and evaluating results and interpretations as well as for gaining maximum benefit by applying the data to many and various global change problems. It has been recognized that Landsat Continuity Mission data would also provide an enormous amount of information for a wide variety of other scientific and applied uses.

The foremost technical requirement for the Landsat Continuity Mission is to enable the identification, documentation, and analysis of global land cover and land use change. Land-cover change must be measured with sufficient spatial resolution (baseline resolution is the current Landsat-7 capability, see Table 1) to determine accurately the amount of change, its location, and its cause or some diagnosis thereof. The data must have sufficient temporal resolution (seasonal) to address interannual variability. The overall science objective calls for systematic measurements of land-cover and land-cover change that can be consistently interrelated over the entire span of collected data, including the past 26 year data record established by Landsats 1-5.

The attributes of the data from the Landsat Continuity Mission are: · Coverage of the Earth's entire continental and coastal surfaces repeated seasonally, · Spatial resolution and multispectral coverage commensurate with the current Landsat system, · Radiometric calibration traceable to the National Institute of Standards and Technology, · Geolocation accuracy supporting U.S. National Mapping Standards for 1:100,000 scale maps, and · Continuity with heritage Landsat data, except for the thermal infrared band.

The required system performance specifications for the Landsat Continuity Mission, based on Landsat-7's, are summarized in Table 1. New technologies and techniques, such as synthesizing Landsat-7 equivalent bands from a hyperspectral imager, are acceptable providing spatial, spectral, radiometric, temporal, and areal coverage equivalence to the heritage data can be validated.

Options for enhancing these system capabilities may be considered to improve the resulting data. Possible options include: · Adding atmospheric correction, · Improving geolocation accuracy, · Improving radiometric accuracy, · Adding multispectral thermal channels, and/or · Employing a hyperspectral capability.

Respondents may provide information pertaining to any enhancements (the above or others) that they feel are necessary to meet their business goals as long as the baseline data attributes defined in this RFI are addressed.

TABLE 1. Heritage System Performance Specification. BEGIN

P = PARAMETER SPS = System Performance Spacification (Consistent with Landsat-7)

P1: Orbit SPS: Sun synchronous near-polar circular orbit

P2: Equatorial crossing time (descending) SPS: 10:00am +/- 15 min.

P3: Land area collected per year, sq. km SPS: Total: 2.9 x 10 9

P4: Global Coverage SPS: Acquire essentially cloud-free, sun-lit coverage of all continental areas a minimum of once per year with seasonal coverage for most areas, and every overpass of all 50 U.S. states.

P5: Revisit: days SPS: ~16 or less (orbit repeat)

P6: Spectral bands:

SUBP6.1: VIS (blue),µm SPS: Band Edges: 0.45-0.52; Low Rad*: 4.00; Min SNR: 31; High Rad*: 19.00; Min SNR: 103

SUBP6.2: VIS (green),µm SPS: Band Edges: 0.53-0.61; Low Rad*: 3.00; Min SNR: 33; High Rad*: 19.37; Min SNR: 137

SUBP6.3: VIS (red), µm SPS: Band Edges: 0.63-0.69; Low Rad*: 2.17; Min SNR: 25; High Rad*: 14.96; Min SNR: 115

SUBP6.4: NIR,µm SPS: Band Edges: 0.75-0.90; Low Rad*: 1.36; Min SNR: 28; High Rad*: 14.96; Min SNR: 194

SUBP6.5: SWIR,µm SPS: Band Edges: 1.55-1.75; Low Rad*: 0.40; Min SNR: 24; High Rad*: 3.15; Min SNR: 134

SUBP6.6: SWIR,µm SPS: Band Edges: 2.09-2.35; Low Rad*: 0.17; Min SNR: 18; High Rad*: 1.11; Min SNR: 96

SUBP6.7: Panchromatic,µm SPS: Band Edges: 0.52-0.90; Low Rad*: 2.29; Min SNR: 15; High Rad*: 15.63; Min SNR: 88

P7: Band-to-Band Registration, pixels SPS: < 0.1

P8: Radiometric Accuracy

SUBP8.1: Absolute, % SPS: 5 SUBP8.2: Relative, % SPS: 2

P9: Ground Position Accuracy, meters SPS: 250 (1 sigma)

P10: Ground Sample Distance:

SUBP10.1: VNIR/SWIR, meters SPS: < or = 30

SUBP10.2: Panchromatic, meters SPS: < or = 15

P11: Ground Scene Dimensions, km SPS: 185 x 170 (cross-track by along-track,nominal)

P12: Ground Reference Grid SPS: Landsat Worldwide Reference System

P13: Dynamic Range, % SPS: 0-100 Lambertian Reflectance (Sun @ Nadir on equator)

P14: Quantization SPS: Sufficient to meet SNR and Dynamic Range

TABE 1. Heritage System Performance Specification. END

*Low Rad and High Rad refer to the low and high input spectral radiance (in mW/cm2-sr-mm) used to produce the minimum Signal to Noise Ratios (SNR).

The Landsat Continuity Mission requires the delivery of science-quality digital data products to meet the government goals. Specific data products required by the U.S. government are: · Raw digital image data with the associated files required for radiometric correction and geocoding (Level 0R product), and · Algorithms and calibration data needed to develop Level 1R (systematic radiometric corrections) and Level 1G (systematic radiometric and geometric corrections) products.

The following assumptions are to be used in the preparation of the response to this RFI: · The vendor must provide to the USGS Level 0 data and document all instrument characteristics and algorithms necessary to produce Level 1 data, including pre-launch and on-orbit instrument calibration procedures and reports; · The requirement is for the purchase of data over a minimum period of 5 years commencing in 2005; the vendor should describe his plans to make data available beyond this time period as an option; · About 50 specific, cloud-free, sunlit scenes per day should suffice to meet the global change research community's requirements; however, it is estimated that 250 scenes/day (covering 2.9 x 10 9 km2 of the Earth's surface per year) may have to be acquired to achieve that requirement unless the contractor can show that his system can provide the required seasonal cloud free (80% or better) global land surface coverage with fewer scenes; · Timeliness requirements vary from the need for receiving data as soon as possible to a tolerance for delays of weeks to a few months; · The government must have a contractual arrangement that provides reasonable assurance that the required data will be available on the specified schedule with the required quality; while the preferred method of payment is cash-on-delivery of data, other funding arrangements, such as partnerships or other innovative and cost-effective procurement approaches, which provide this assurance and can be shown to be mutually beneficial will be considered; · The federal government intends to archive and distribute, at the cost of reproduction, the purchased data in support of its various government agencies, objectives, and missions; the government may not wish to limit this distribution to only federal agencies and their affiliated users, and thus any cost difference associated with unlimited distribution rights should be addressed; alternative data rights

may also be suggested; and · Per the Land Remote Sensing Policy Act of 1992, these data must be made available for long-term preservation by the USGS National Land Remote Sensing Data Archive.

For a broad understanding of the legal requirements for the Landsat Continuity Mission, and to understand the NASA's view of the Landsat Continuity Mission and its requirements within the context of the far term Earth Science Enterprise vision, respondents should review the references listed in Table 2. These documents serve as a basis against which respondents can frame their land remote sensing concepts.

TABLE 2. References. BEGIN 1. Land Remote Sensing Policy Act of 1992 Public Law 102-555 28 October, 1992, 102nd Congress; URL: http://geo.arc.nasa.gov/sge/landsat/15USCch82.html

2. Commercial Space Act of 1998; URL: http://geo.arc.nasa.gov/sge/landsat/sec107.html

3. Report of the Post-2002 Mission Planning Workshop, Easton, Maryland, 24-26 August 1998; URL: http://www.earth.nasa.gov/visions/Easton/Indexmain.html

4. Earth System Science Research Themes; URL: http://www.earth.nasa.gov/science/index.html

Table 2. References. END

FORMAT OF THE RESPONSE:

Sources with information relevant to this request are asked to respond by submitting a response of no more than ten (10) pages of text (minimum font size: 10) and five (5) pages of figures and/or tables which conforms to Table 3, "Template for Landsat Continuity Mission". The response shall clearly describe the overall concept (including both flight and ground segments, as well as options/enhancements for the benefit of the government, the respondent, or both) and shall include estimated costs, maturity/risk assessments, and a data validation concept.

Innovative concepts for archiving and distributing Landsat data are invited as part of this RFI.

Data rights /policies must be described consistent with government policy for data use in support of the agencies' missions and objectives.

System performance and cost issues pertaining to the Landsat data continuity requirements should be identified.

All information received from this RFI will be compiled and used for planning purposes. The results of this RFI may be reported outside NASA and USGS; therefore, any proprietary information submitted should be marked appropriately. Respondents are urged to describe their technology in sufficient detail to allow NASA and USGS to corroborate the ability of the respondent to meet Landsat data requirements.

The information received in response to this RFI will be reviewed by a panel of NASA and USGS experts. The resulting recommendations may be used to formulate a future procurement action by NASA.

TABLE 3. Template for Landsat-7 Continuity Mission. BEGIN

Topic 1: Mission Parameters; · Spacecraft parameters · Instrument parameters · Orbit parameters · Mission overlap, formation flying, orbit coordination, station keeping, etc.

Topic 2: Ground System Concept . Top level schematic including mission ops, data downlink, data handling, science data processing, accessing and archiving (short term)

Topic 3: Launch Vehicle Candidates · Description

Topic 4: Quantitative Assessment of Programmatic and Technical Risks · Mitigation approaches

Topic 5: Mission Master Schedule · Operational date: 2005

Topic 6: Strategy for costs and pricing · Estimated price per Landsat-equivalent scene · Relevant budget information in support of the strategy (e.g., estimated system costs, partnerships, budget profile) · All assumptions

Topic 7: Data Considerations · Proposed data rights and data distribution policies · Approach/concept for validating equivalency to heritage data

Topic 8: Assurance Considerations · Proposed mechanisms that assure the government that the data will be available on time, over the period specified, and of the quality promised.

Table 3. Template for Landsat-7 Continuity Mission. END

(If providing a printed response, please provide an electronic copy in Microsoft Word format, Office 97 compatible.)

THIS IS A SOURCES SOUGHT/RFI SYNOPSIS NOT A NOTICE OF IFB, RFP, OR RFO ISSUANCE. No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released it will be synopsized in the CBD and on the NASA Acquisition Internet Service. It is the potential offerors responsibility to monitor these cites for the release of any solicitation or synopsis.

Responses must include the following: name and address of firm, size of business; average annual revenue for past 3 years and number of employees; ownership; whether they are large, small, small disadvantaged, 8(a), HUBZone, and/or woman-owned; number of years in business; affiliate information: parent company, joint venture partners, potential teaming partners, prime contractor (if potential sub) or subcontractors (if potential prime); list of customers covering the past five years (highlight relevant work performed, contract numbers, contract type, dollar value of each procurement; and point of contact - address and phone number). Technical questions should be directed to: Commercial Remote Sensing Program Office, Fritz Policelli (228)688-7708 or Tom Stanley (228)688-7779 . Procurement related questions

To: rbyrnes@IGSRN.PO2; lpetting@IGSRN.PO4; "code-
From: Charles Wende <cwende@hq.nasa.gov>
Subject: Landsat Data Buy RFI
CC: "darrel.williams@gsfc.nasa.gov"@IGSRN_MA.SMTP;
Date Sent: Wednesday, July 7, 1999 7:40 AM

Folks,

The Landsat Continuity Mission Request for Information hit the street (rather, the WWW) late yesterday afternoon. The URL is given below.

Note the comment about "new format". Procurement cannot deal well with tables or bullets. If anyone wants a clean, readable, as-written copy, let me know today or tomorrow and I will email you one.

Cheers,

- Chuck

>From: "Policelli, Fritz" <Fritz.Policelli@ssc.nasa.gov>
>To: "'Charles Wende'" <cwende@hq.nasa.gov>
>Subject: FW: url
>Date: Tue, 6 Jul 1999 16:35:50 -0500
>
>Chuck,
>
>The RFI has been released. The URL below will take you directly to it.
>Procurement had to modify the format of the tables to put them in. Tom and
>I are looking at that now to make certain that the new format is clear.
>
>Fritz
>
>> -----Original Message-----
>> From: Stanley, Tom
>> Sent: Tuesday, July 06, 1999 4:26 PM
>> To: Policelli, Fritz
>> Subject: url
>>
>> http://procurement.nasa.gov/EPS/SSC/Synopses/SSC-LCM-RFI-1/synopsis.html
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