

**U.S. GEOLOGICAL SURVEY/EROS CENTER
TECHNICAL REQUIREMENTS DOCUMENT
for
TECHNICAL SUPPORT SERVICES CONTRACT SOLICITATION**

TRD NUMBER

19

PERFORMANCE PERIOD

Contract Base Year: **April 1, 2010 thru March 31, 2011**

PROJECT NAME

Long Term Archive

Scope:

USGS/EROS performs the critical role of managing and preserving the remote sensing, cartographic and Earth science archives for the USGS LRS and GIO Programs through the use of databases and collections management techniques and strong adherence to archival standards. The Long-Term-Archive (LTA) project is given the responsibility for the management, quality assurance, operations, and maintenance of film and digital collections within the USGS/EROS Long-Term-Archive.

The LTA will maintain, preserve, and provide ready access to historical remote sensing film and digital databases and archives. It includes activities related to operations such as physical handling of film and digital media including inventory control and management, data organization and management, data ingest, metadata generation and ingest, data set appraisal and dispositions as requested including transfers to NARA and preservation activities such as data set transcriptions and media migrations for collections in both the LTA and NSLRSDA. The LTA manages, maintains, and provides archive data access, preservation, and distribution services to projects including engineering, software development, hardware procurement, system integration and testing. In the event of an earthquake, hurricane, fire, flood and other natural and manmade disasters, the LTA will assist and prioritize its efforts to ingest and provide access to satellite and aerial imagery to meet the data requirements of the first responders and decision makers to the extent possible with resources provided.

This Technical Requirements Document (TRD) includes the scope and funding associated with the following SOIs:

1. NGP: Emergency Operations
2. NGP: Gen IT – IT Maintenance (labor) – Archive Data Management
3. LRS: Emergency Operations
4. LRS: Long Term Archive (LTA)

Because these SOIs include common functionality and processes such as data ingest, management and distribution that require many of the same systems, software and labor skills; the work activities are integrated and managed within the scope of the LTA TRD. This approach permits more consistent management and effective leveraging of common long-term data and archive management processes, archive access and distribution infrastructure, and TSSC labor resources.

Objectives:

- Provide technical management oversight and coordination for long-term preservation of historic aerial and satellite topographic, cartographic, High Resolution Ortho Digital Imagery and other earth science collections acquired from government and commercial sources.
- Ingest and manage satellite and aerial digital and photographic data.
- Manage, operate, and maintain photographic and digital archives and ensure long-term preservation of archival holdings.

- Appraise and dispose of the historical collections; add new collections that are aligned to program objectives and USGS mission.
- Improve public access to archive holdings and provide capability to generate scanned products from the aerial and declassified satellite film archive.
- Web-enable historical collections to provide data to the public at no charge over the internet.
- Create a 25 micron digital copy of USGS aerial film and web-enable.
- Provide basic user email and phone support to the public and work towards customer self sufficiency.
- Provide a limited, fee-based capability for customers to request selected images from the film archive for scanning and provide products using the appropriate resources.
- Manage Emergency Operations events and respond to pre- and/or post-disaster events by prioritizing systems and staff to load, ingest and provide access to remote sensing and earth science data sets as rapidly as possible with the resources available.
- Develop systems that for rapid ingest, processing and dissemination of remote sensing imagery.
- Provide for effective and efficient engineering, software development, operations and maintenance of archive data access, preservation, and distribution infrastructure. Major systems include:
 - AVHRR/ADAPS Production
 - Earth Explorer
 - Earth Observing One (EO-1)
 - Global Visualization (GloVis)
 - Production Inventory
 - RADAR Processing System (RPS)
 - TerraLook
 - Tracking, Routing, and Metrics (TRAM)
 - EO Portal including Hazards Data Distribution System (HDDS)
 - Mass Storage System
 - Data Distribution System
 - Commercial Imagery Derived Requirement (CIDR) Tool

In support of the LTA project, the Technical Support Services Contractor (TSSC) is delegated responsibility for long-term data and archive management for aerial and satellite data in the USGS/EROS archives except digital Landsat, MODIS, Lidar, and ASTER data. TSSC has responsibility for user support; product generation and distribution; and information systems development, maintenance and operations and evolution of the archive access, preservation and distribution infrastructure. Currently, the archive consists of over 107,000 rolls of aerial and satellite imagery containing in excess of 13 million frames. It also includes a growing digital inventory on magnetic tape in a near-line mass storage systems and off-site backup tapes currently totaling nearly 1.1 petabytes.

The LTA is organized into 2 tasks. Task 1 - Archive Access and Preservation and Task 2, and Access and Delivery Systems Support Specific objectives for each task follow:

Task 1: Archive Access and Preservation

This Task will maintain, preserve, and provide ready access to historical remote sensing databases and archives. It includes activities related to operations such as data organization, ingest, metadata generation and ingest, data set appraisal, assessments, dispositions including film transfer to NARA and preservation activities such as data set transcriptions, media migrations, and maintaining off-site backups for collections in the LTA including NSLRSDA. It also includes tasks to develop, evolve, and manage the infrastructure required to store, access, and distribute data within the Archive. Activities associated with physical handling of film and digital media including data receipt and inventory control and management are also included.

Task Objectives:

- Receive and ingest aerial and satellite film and digital data and metadata, including commercial and emergency operations data sets, and maintain the databases necessary for long-term management and public access. Provide ingest and data management services to other Data Management Division projects upon request.
- Operate and maintain the LRS Commercial Imagery Derived Requirement (CIDR) database. Distribute commercial data sets to the public including no-charge web downloads with appropriate licensing and other restrictions applied per signed agreements.
- Provide basic user email and phone support to the public and work towards customer self sufficiency through continual development and evolution of web pages, search engines, fact sheets and FAQ's.
- Provide web-enabled downloads of all data sets managed by the LTA and in some cases of high volumes on external disk media.
- Systematically scan aerial vinegar syndrome affected film to a standard format high resolution 25 micron digital image using Phoenix V scanners operating 24X5.
- Operating scanners resources generate 25, 14, and 7 micron scans to fulfill requests from customers for selected images from the film archive. These scans will be generated in an on-demand basis for a fee.
- Develop, implement and operate a capability to provide "bulk" distribution of archived data via large capacity USB drives using specifically configured high bandwidth network connections.
- Manage, engineer, operate and maintain the CR#1 Mass Storage System. Create and implement a cost sharing management plan for projects that utilize this system.
- Maintain a current backup copy of archived digital data in an off-site facility.
- Operate and maintain systems that schedule, acquire, process, archive and distribute AVHRR, EO-1, and RADAR products.
- Perform activities that ensure long-term preservation of historical digital and film archive holdings including collection appraisal and disposition, monitoring and testing for degradation, transcribing and/or migrating media to modern technologies,

and transferring data when necessary and appropriate to NARA for permanent storage.

- Coordinate with external USGS and other agency data managers as necessary to support the EROS mission to acquire, archive and distribute earth science data.
- Provide support for data services and access for other federal agencies such as USGS/NPS, USFS, and Eagle Vision.
- Support activities to engineer and maintain systems and software; procure hardware, software, and supplies as required to host the data set collections of current and newly acquired digital data sets.
- Maintain Security, Contingency and Privacy Plans.
- Receive, ingest, manage, maintain, and distribute data and metadata for long-term archival of high resolution ortho digital imagery data sets, DEMs, DLGs, DRGs, DOQs (4D) datasets; the National Atlas data set, and NED data set.
- Ingest, manage, and provide access to first responders to pre and post-event data available immediately following a disaster.
- Distribute emergency operations support data and status reports via the Hazards Data Distribution System and ensure that the systems remain operational and ready to support disasters.
- Provide support to external agencies that have systems on campus at EROS including the National Guard Bureau (NGB) by interfacing with their UDIM system to allow for rapid dissemination of high-resolution imagery and WRD by providing engineering and hardware maintenance support of their GOES, NWIS-RT, and NATWEB systems.

Task 2: Access and Delivery Systems Support

This task is to manage the LTA software engineering and development activities, and provide the necessary software system enhancements as deemed necessary. It is to oversee and support activities to engineer and maintain systems and software; perform analysis and make hardware, software, and supplies recommendations as required. It includes AVHRR Data Acquisition and Processing System (ADAPS), Commercial Imagery Derived Requirement (CIDR) tool, Earth Explorer (EE), Earth Observing One (EO-1), Global Visualization Viewer (GloVis), Inventory, Hazards Data Distribution System (HDDS), RADAR Processing System (RPS), Tracking Routing and Metrics (TRAM) service and TerraLook.

Task Objectives:

- Develop systems and software necessary to process archived collections to a format and level suitable for web-enabled downloads of the data sets.
- Develop processes and infrastructure to efficiently enable no-charge web downloads of historical archive data sets to the public.
- Provide improved public access to archive holdings through tools such as Earth Explorer (EE), and GloVis.
- Provide software development and maintenance support for ADAPS, Greenness Mapping, TRAM, Earth Explorer, GloVis, LTA Inventory, RPS, TerraLook, CIDR,

HDDS, and the SOA modules that comprise the archive access and distribution infrastructure. Create and implement a cost sharing management plan for projects that utilize these systems.

- Provide software support to implement a production flow for creating high resolution digitized products using the high-resolution scanning backs combined with the current digitizing systems hardware.
- Support the LDCM project along with LTA needs in redesigning the current Earth Explorer to implement the new requirements for functionality as well as performance and to eliminate the proprietary software within the current version of EE.
- Incorporate systems, procedures, and processing flows that other projects require in using LTA systems to meet their needs.
- Establish and conduct Configuration Control Boards (CCB's) and provide services to projects requesting support. Establish milestones and monitor adherence to master plans and schedules.
- Utilize and/or tailor systems to software engineering best practices, procedures, and guidelines for the planning, analysis, design, development, and operation phases of the Systems Life Cycle (SLC).
- Allow for the continuance of basic engineering, operations and maintenance of emergency-specific systems including the Hazards Data Distribution System (HDDS) and all supporting aspects of the HDDS, e.g., (EO Portal and HTTP Downloads).
- Maintain systems that allow for the rapid ingest, processing and dissemination of satellite and aerial hazard imagery.
- Enhance capabilities within the architecture to make satellite imagery available in the shortest time possible

Deliverables:

- Provide regular reports of archive volumes and growth.
- Provide performance metrics for data transfer, ingest, management, and distribution.
- Provide photo scanning performance metrics.
- Provide monthly progress reports.

Schedule:

Work objectives described in Task #1 are by nature an “Operations and Maintenance” task and, as such, continue seamlessly throughout the fiscal year and into the next fiscal year with little change in scope.

Some of the objectives described in Task #2 are system engineering and development. These objectives are planned within the context of a master schedule and milestones that are targeted to requirements of projects that obtain services from the LTA.

Communication:

Project communication consists of both formal and informal settings using varying venues in order to ensure effective communication between TSSC and USGS project management staff. In addition, the project's management team interacts informally on a

daily basis in respond to unforeseen requirements and requests and produces ad-hoc reports as required.

- Weekly Project meetings
- Weekly highlights supporting LRS and GIO activities
- Monthly status and progress reports including performance metrics
- Quarterly accomplishments reports
- TSSC LTA Work Plan
- TSSC LTA Commitment
- Master software schedule and CCB minutes
- Miscellaneous other ad-hoc meetings and reports as requested.