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

TRD NUMBER

0023

PERFORMANCE PERIOD

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

PROJECT NAME

Topographic Science, Elevation, & Lidar Science

Scope

This Technical Requirements Document defines requirements for science support for the Topographic Science, Elevation, & Lidar Science Branch at the U.S. Geological Survey (USGS) Earth Resources Observation and Science (EROS) Center, to be provided by the Technical Support Services Contract (TSSC). There are three main projects in this branch: Topographic Science, Elevation, and Lidar Science. The TSSC work manager will interface with the staff and report to the USGS Branch Manager. This document outlines the USGS work requirements that will be performed by TSSC staff, subject to available funding. It will be updated to reflect major direction and priority changes throughout the contract period.

Deliverables

Topographic Science Project

Updated GTOPO30 global digital elevation model - Jeff Danielson, USGS Task Lead

- Per the agreement with NGA, conduct work toward an updated GTOPO30.
- Provide input on status, activities, and accomplishments for weekly Director's report
- Quarterly Progress Reports are required as well as a detailed summary report for Quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

Southern California Hazards

- Assist in construction of a lidar geodatabase of hydrological derivatives for testing debris-flow parameters.
- Translate LAHARZ model to Python, incorporating parameters for southern California debris-flows.
- Construct hydrological derivatives with NED 10-meter for southern California as a platform for a regional Decision Support System.
- Work with the debris-flow modeling group to examine the sensitivity of model results to lidar and cartographic data sources
- Publish findings in the open literature or on the Internet, participate in symposia, and interact on a colleague-to-colleague basis.
- Produce peer-reviewed publications detailing the application of USGS hydrologic derivative databases for debris-flow modeling.

  Update Elevation Derivatives for National Applications (EDNA) Web site and viewer.

- Provide input on status, activities, and accomplishments for weekly Director's report
- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

Elevation Project

NED Operations

- Perform bi-monthly updates of 1-arc-second and 1/3-arc-second NED that incorporate new USGS 7.5-minute DEM production and newly acquired partner elevation data.
- Load the updated NED elevation data, shaded relief images, and spatially referenced metadata to the seamless delivery system.
- Produce and distribute NED Release Notes describing the characteristics of the NED source data and production issues associated with each release.
- Perform automated update of 1-arc-second and 1/3-arc-second resolution NED layers based on new 1/9-arc-second source material.
- Modify and enhance bi-monthly NED update procedures to increase automation, efficiency, and output data quality.
- Develop procedures to integrate high-resolution elevation data into the highest resolution NED layer (1/9-arc-second).
- Coordinate and chair the weekly NET telecom
- Serve as first POC for Topo Science-related inquiries from Customer Service
- Serve as liaison to GIO State Liaisons for lidar and elevation data
- Coordinate receipt and transfer of lidar and elevation data between EROS and the NGTOCs or other contributors
- Provide input on status, activities, and accomplishments for weekly Director's report
- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

Data integration

- Develop procedures for integrating contour derivatives from NED with streams and lakes data for graphic applications.
- Provide input on status, activities, and accomplishments for weekly Director's report
- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

Contours

- Support development and deployment as Web tools of procedures for generating contour derivatives from NED for graphic applications.
- Enhance the existing ArcGIS Server pod hardware to provide enough processing power so the public can use the ArcGIS Server-based contour tool.
- Perform data management, reporting, and job tracking functions. Examples include (but are not limited to):
    - Keeping track of the quads for which NGTOC will be producing topo maps in FY10
    - Keeping track of which quads we (or the NGTOC) have generated contours

    - Determining which quads need various types of preprocessing based on criteria such as DEM production method and whether the DEM was hydro-enforced
    - Obtaining updates for NHD as they become available, loading into ArcSDE, and updating the dataset with information needed for contour generation
    - Keeping track of new 1/9" NED, and flagging the database wherever the new raster data completely covers a quad
    - Updating the 7.5' quad attribute table with the minimum statistically valid contour interval that the NED data for each quad supports

Perform basic GIS manipulation (overlaying data, updating attribute tables, maintaining geospatial data) in support of this task.

- Provide input on status, activities, and accomplishments for weekly Director's report
- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

FAA tool development

- Support development and deployment of new Web-based tool for the Federal Aviation Administration
- Provide input on status, activities, and accomplishments for weekly Director's report
- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

Applied Research

- Provide primary point of contact for NWIS Ground-Water User Group. They are interested in attaching elevation values to a large wells data set.
- Enhance DEM generalization procedures.
- Develop a historic NED layer.
  Develop enhancements to the spatial metadata model.
- Technology Assessment: Conduct investigations related to lidar processing, feature extraction, and application of interest to NGPO.
- Investigate the integration of inland bathymetry (lakes and rivers) into multi-resolution NED, which include acquisition and assessment of existing bathymetric datasets from multiple sources
- Provide input on status, activities, and accomplishments for weekly Director's report.
- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.
- Additional Deliverables for TRD version 2.1

- Coordinate installation, testing, and release of ESRI server software updates from Arc 9.2 to Arc 9.3
- Serve as a primary resource for ArcGIS Server and ArcGIS Image Server evaluation, testing, and implementation.
- Investigate capabilities and propose an implementation plan to integrate JTX workflow management software into elevation change tracking and NED development activities. This work will include coordination with IRIS software.
- Serve as a primary contact for computer resource management issues for the project.
- Support installation and implementation of new project-level storage area network (SAN) system expected to be procured in FY 2009.
- Support development of a new service on the Topo/bathy Web site to compute a selectable coastline (mean sea level, high mean sea level, etc.) in real time from merged topo/bathy data.

Lidar Science Project

Lidar Science Coordination

Maintain and enhance the online, Web-based Center for Lidar Information, Coordination, and Knowledge (CLICK).

- Process lidar data for ingest and upload to CLICK
- Maintain metadata layers for CLICK
- Maintain and update the CLICK Web Portal (BB, Users, Resource Links)
- Serve as point of contact for Customer Service calls
- Maintain detailed documentation of lidar and elevation data for the Topo Science Branch
- Perform separation and reorganization of lidar and elevation data as it is received to facilitate ease of use by both NED and CLICK operations
- Manage post-production archiving process of lidar and elevation data

Coordinate logistics for workshops and conferences supported by the Lidar team. As needed, develop and participate in training classes and workshops on lidar technology support.

Maintain and develop the on-line point cloud distribution system, improving on the prototype already developed.

Produce weekly reports on all above activities, including updates on:

- Data activities (include details on source, project location, area covered, data contents, data size, data location)
  - For data received, reorganized, shipped, processed, archived
- CLICK Web Portal updates
- Customer Service interactions

- Quarterly Progress Reports are required as well as a detailed summary report for quarter 4 describing the work completed and other accomplishments. All the above needs to be completed by 9/30/2010.

Schedule

All work is to be performed in a timely manner as determined by the USGS Project Manager working in coordination with the TSSC Management.

Communication

The USGS will meet with TSSC Management quarterly, or at a frequency requested by the USGS, to discuss expenditures and emerging requirements. The contractor shall keep the Government project manager informed of all activities, such as work successes, problems, and potential problems as soon as they are known. Other communications required by the USGS in support of work may include quarterly briefings, special reviews, and presentations at key events.

The contractor will understand requirements of the project and ensure expectations are met by:

- Developing the associated work plan and monitoring its execution/progress
- Assisting in the coordination or facilitation of external cooperative agreements
- Coordinating and contributing to status reports (e.g., quarterly reviews, annual reviews), assisting as needed, collecting and /or editing content; and coordinating ad-hoc data calls, presentations, or visitors
- Reporting expenses from ITS
- Notifying the Help Desk of changes in ownership of software, desk and laptop systems, servers, etc.
- Identifying areas of overall or specific risk and participating in mitigation strategies
- Coordinating with finance staff to assist with income calls and updates