

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

**TRD NUMBER**

0006

**PERFORMANCE PERIOD**

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

**PROJECT NAME**

Early Warning, Environmental Monitoring, and Hazard Mitigation Part 2

## **1.0 Scope**

This Technical Requirements Document (TRD) defines requirements for science support for the Early Warning, Environmental Monitoring, and Hazard Mitigation (EWEMHM) Part 2 Project at the USGS Earth Resources Observation and Science (EROS) Center to be provided by the Technical Support Services Contract (TSSC) to the USGS EROS staff. Support beyond that identified in this TRD will be addressed by the USGS Project Manager as needed. The Technical Support Services Contractor (TSSC) has corresponding work managers who shall interface with the staff, monitor performance, prepare reports in coordination with the task leads, and report to the USGS Project Manager. This TRD outlines the USGS work requirements that shall be performed during the period of April 2010 through March 2011 by TSSC staff, subject to available funding. The TRD is considered a living document that will be updated to reflect major direction and priority changes throughout this performance period.

Projects included under this TRD are the United Nations Environment Programme Global Resources Information Database (UNEP GRID), National Atmospheric and Space Administration Solar and Wind Energy Resource Assessment (NASA SWERA), NSD and Web Support, and NASA Livestock Early warning System (LEWS). UNEP GRID conducts environmental assessments in developing parts of the world and utilizes remote sensing and other geospatial data sets to accomplish these studies. The NASA SWERA project archives and distributes information about potential solar, wind, and low-head hydropower for seventeen countries over the web. The NSD and Web Support project is focused on development of a national spatial data infrastructure for Afghanistan to support reconstruction and economic development. Afghanistan Surface Water is concerned with characterizing snowmelt and stream flow to determine water availability for agriculture and domestic use and to provide early warning of floods. NASA LEWS is developing an early warning system for monitoring water resources and pasture for livestock and pastoral food security.

## **2.0 Deliverables**

### **UNEP GRID**

1. Provide design support and content for UNEP's larger publications (e.g., GEO-Yearbook; One Planet, Many People; etc.) produced from USGS data and science.
2. Provide support for UNEP GRID's adherence to interoperability standards and open data policies on the UNEP GRID Sioux Falls web site and promotion of the same policies throughout UNEP.
3. Provide support for UNEP GRID's visiting scientist program—a capacity building program helping environmental scientists, primarily from developing nations, to learn methods, technologies and data sources for application of remote sensing and GIS to national and global environmental problems.

- Support those visiting scientists in depicting original research by demonstrating graphics techniques and in making design and graphics contributions to ongoing UNEP GRID Sioux Falls projects which use USGS data and science.
4. Support UNEP GRID Sioux Falls in promoting USGS and NASA remote sensing products, GIS technologies and expertise within the international environmental community. Support the development of internet based systems of dissemination of USGS Earth observation data as well as products derived from that data to international users. Provide design and graphics technical expertise to support original, multidisciplinary research by visiting scientists on topics of land cover change and environmental management. Support UNEP GRID Sioux Falls' production of print publications, posters, reports and brochures intended for environmental decision-support and public education. Support UNEP GRID Sioux Falls in providing USGS data and products for publications to be produced in other UNEP offices.
  5. Assist UNEP with briefings, posters, brochures and publications that will promote awareness of the relevance of USGS land remote sensing programs to GEOSS work plan targets. UNEP will engage scientists implementing work plan activities around the world to ensure that opportunities to include USGS remote sensing data, products, and systems are taken wherever appropriate.
  6. Help UNEP prepare and support the publication of hardcover publications of African, Arab, and Central and South American country atlases of environmental change.
  7. Help UNEP promote the use of USGS land remote sensing data, science, technology and expertise in the international environmental and development communities. USGS data and products will be used in the production of books, web content, brochures, briefing notes, posters and presentations. Information promoting the use of USGS science and data will be included in all of these outputs.
  8. Assist UNEP in continuing development of a relationship with Google Earth where the high visibility of Google can be used to raise awareness of remote sensing data and science as well as to broadly disseminate content produced with USGS data and science.
  9. Support UNEP in hosting 10 or more visiting scientists from developing nations. The program will continue to produce original research as well as providing capacity building experience and training for participants. The use of USGS technology, science, data and expertise will be emphasized during these visits. Training in the use of GIS, cartographic design, and image processing, as well as in applications of remote sensing data, will comprise a large component of the visiting scientist program.
  10. Contribute to monthly and annual USGS reporting.
  11. Provide administrative support as needed to the Regional Coordinator, UNEP Division of Early Warning & Assessment - North America.

NASA SWERA (Renewable Energy Decision Support System)

12. Develop and stage new SWERA internet mapping and graphing applications.
13. Support the hydrologic modeling and analysis requirements of SWERA.
14. Provide GIS support for the project.
15. Undertake a SWERA website revision requested by UNEP/DTIE

#### NSD and Web Support

16. National Spatial Data Infrastructure (NSDI) activities that include negotiations with Afghan ministries, donors, and NGOs; implementation of the Project Coordination Office for the Afghanistan Spatial Data Infrastructure (ASDI); and hosting of the second national ASDI workshop.
17. Continue metadata development for all USGS Afghanistan datasets being hosted at EROS.
18. Development of a long-term plan for archiving USGS Afghanistan datasets.
19. Research and development on a user interface to address interest in Google-like interfaces, develop a tool for accessing a national hyperspectral dataset (collected by USGS), and assess need for additional tool development.
20. Ongoing maintenance, staging, distribution and archiving of project data (spatial and non-spatial) on the USGS Afghanistan project website.
21. Continue revision of creative content in the public pages of the project website.
22. Ongoing IADD support for website development and maintenance.

#### NASA Livestock Early warning System (LEWS)

23. Run the hydrologic model developed for monitoring waterholes in an offline mode and calibrate and parameterize the model.
24. Evaluate model results using field and ancillary data.
25. Implement a benchmarking process to evaluate the usefulness of the NASA LEWS project for decision makers and coordinate its initial phase.
26. Coordinate the completion of the seasonal livestock migration pattern with field survey and GPS-tracking data.
27. Evaluate and refine the performance of water resources monitoring products using field data.
28. Coordinate and assess the integration of operational water resources products with early warning assessment reports.
29. Produce a written report with a quantitative analysis of the hydrologic model validation and calibration using field and ancillary data.
30. Generate a written report on the setup of a benchmarking process following NASA's system engineering design approach.
31. Coordinate and conduct hands-on training at the Sioux Falls High School District in the use of remotely sensed data for weather hazard monitoring.

### **3.0 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.

## **4.0 Communication**

The USGS requires informal verbal communication on a biweekly basis from the TSSC work manager. There may be times when specific information is required or issues need to be addressed more quickly, and the USGS may require specific briefings from TSSC staff on these occasions. In addition, the USGS will frequently require TSSC staff to work and communicate with SSSC staff to achieve coordinated and/or desired outcomes. Direct communication between TSSC and SSSC regarding technical details is strongly encouraged. TSSC technical staff should be prompt to report any issues that arise that might impact the delivery of products and services or their schedule. A monthly status report (documenting work progress, plans, issues, risks and mitigation efforts) will be delivered by the work manager such that timely evaluations of the work can be made. USGS requests direct delivery to the project and task leads.