

Proposal for TWRI Water Resources Research 2004

Utilization of GIS (Geographic Information System) in water resources management and planning in the Paso Del Norte Region

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Amount of Funding Requested:

\$7,750.

Project Description

Background: As a result of drought, surface water delivery was reduced significantly, which only accounts for 34.1% of the full supply. Improvement of delivery efficiency becomes even more urgent. One of the important components for such improvement is a system for monitoring river flow and water quality and sharing information in a “real-time” manner as much as possible. To address this issue, the TAMU El Paso Agricultural Research Extension Center teaming with NMSU, UTEP and UACJ developed a coordinated water resources database and GIS project and established a website, which when completed provides an unified easy access to water flow and water quality data needed for water management and planning. This project has been supported by El Paso Water Utilities and the U.S Army Corps of Engineers. TWRI and NMWRRI jointly published a technical report for the Phase I of this project (Brown, Sheng and Rich, 2004, NMWRRI and TWRI Technical Report No. 327).

Project need: With continuing support of EPWU, the Phase II of this project is to expand the capability and increase accuracy of the GIS by verifying existing data and collecting additional data, and to enhance real-time data sharing by regional water stakeholders. To verify physical locations of gage stations, establish more gauge stations as appropriate, and digitize some historic maps to identify changes in the river system, a GPS receiver, a PDA with ArcPad, and a digitizer as well as associated accessories are required. However, the current funding source did not cover the expenses. Therefore, we request TWRI to support acquisition of above-mentioned equipment. If the equipment is funded, additional data collection can be facilitated more efficiently, historical map and data can be easily incorporated into the current database and GIS, and real-time data verification and compilation can be acquired and shared in a more effective way.

Goals and outcomes:

The overall goal of this project is to develop an easy access to water flow and water quality data in the region so that irrigation districts and municipal water utilities managers can make decisions in a timely and more efficient way.

With support of this grant, it is expected that data can be collected in a timely and efficient way and data acquisition capacity will be improved.

Additional data needed for water resource management will be collected and incorporated into the database and GIS website with expanded capacity in data sharing.

A technical report will be prepared and published by TWRI and NMWRRRI to document additional data collection, data sharing protocol, and recommendations for future development.

Benefits:

This project will provide following benefits to the Cities of El Paso, Las Cruces, and Juarez, four irrigation districts in New Mexico, Texas and Chihuahua, and federal agencies, IBWC, USBR and USGS. The information developed by this project will provide:

- Instant access to flow rates and conductivity measurements along the entire stretch of the Rio Grande from Elephant Butte Dam in New Mexico to below El Paso County, Texas will allow irrigation districts, water utilities, and federal water operators to more effectively and efficiently manage water deliveries.
- Flood and water quality management and mitigation strategies will become more responsive and less reactionary, making it possible to better control flood surges or bypass lower quality pulses by IBWC and USBR. The Federal Emergency Management Agency (FEMA) can utilize this information in their disaster response plans. Surface water treatment diversions can be more carefully planned and controlled.
- This new ability to retrieve flow and quality data for the entire stretch of the Rio Grande Project area will allow for the development of an integrated management plan by the USBR and IBWC for averting the over-bank flows resulting from storm events.
- Many other benefits will result from the open sharing of water quantity and quality information among the primary recipients of Rio Grande Project water. Mexico, EBID, EPCWID, and El Paso Water Utilities. For example, water utilities can make timely adjustment in water treatment plant to store excessive water and to blend poor quality water in the ponds.
- New equipment also strengthens TAMU capacity in competitiveness of future project development and ability to obtain external grants.

Submitted by _____
(P.I. signature) Zhuping Sheng, Ph.D., P.E.

Approved for submission _____
(Unit Head signature) Ari Michelsen, Ph.D., Resident Director

**TAES/TWRI
Water Resources Research
Project Budget form**

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Expenditure Description	Amount Requested	Other Sources	Total
Staffing Requirements:			
1) Z. Sheng		\$4,165	\$4,165
2) J. Villalobos		\$2,045	\$2,045
3)			
Fringe Benefits		\$1,590	\$1,590
Total Staffing Cost		\$7,700	\$7,700
Travel			
Supplies and Materials			
Capital Equipment (purchases over \$5000)			
Printing and Publications			
Other Direct Costs (describe in detail)	\$7,750		
Total Project Costs	\$7,750	\$7,700	\$15,450

Other direct cost covers following equipment:

- 1. One GPS receiver, antenna, with post-data processing: \$4,850**
- 2. One digitizer with stand and a click tip pen: \$2,350**
- 3. One PDA and ArcPad license: \$550**

Z. Sheng is the Co-PI for the Coordinated Database and GIS project funded by EPWU (TAES 04-60333). Both Z. Sheng and J. Villalobos are participating in this project.