

Assessment of User Needs Survey

**Installation of River and Drain Instrumentation Stations to Monitor Flow and
Water Quality and Internet Data Sharing**

Project ID: 05-FC-40-2392

Sponsored by

U.S. Department of Interior Bureau of Reclamation (USBR)
El Paso Water Utilities

Prepared for
The Coordinated Water Resources Database Technical Committee
On behalf of the Paso del Norte Watershed Council

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<http://www.pdnwc.org>

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Assessment of User Needs Survey

Prepared by
Christopher Brown, Zhuping Sheng, Bobby Creel and Ari Michelsen

Executive Summary

This report fulfills one of the deliverables under the cooperative agreement on the project entitled, **Installation of River and Drain Instrumentation Stations to Monitor Flow and Water Quality and Internet Data Sharing**, between the El Paso Water Utilities (under U.S. Bureau of Reclamation, Contract No. 05-FC-40-2392) and Texas Agricultural Experiment Station, on behalf of the Paso del Norte Watershed Council.

This report summarizes findings from the User Needs Assessment conducted through an Internet survey. A survey form was developed by the project team with input from the Paso del Norte Watershed Council (PdNWC) Technical Committee. The survey covers topics including the types of water-related data that would be most useful to the survey respondents, their preferred type of data sorting and querying capabilities, the preferred format for downloading queried data, plus requests for any other suggestions for improving the usability of the website. A total of 225 individuals were invited to participate in the survey, of which 47 responded. Based on the survey results, the Coordinated Database Project (CDP) is used on a regular basis by a nearly even split among representatives from government agencies, academic institutions and consulting firms. Reference and downloading of water flow and quality information are useful to CDP users, along with ground water pumping rates and surface flow diversions. The most useful features include the linkage to maps, reporting of “real time” flows and water quality, and well and river diversion locations. Interactive linking to maps is a definite asset, along with posting of the locations for river diversions and pumping wells. Finally, the majority of the survey respondents are aware of URGWOM. The respondents also provided specific recommendations for improvements to the CDP, including addition of data sorting and query capabilities, and more water flow and quality information, especially for river and agricultural return flows. It is anticipated that some of their recommendations will be fulfilled or enhanced by this project, and the linked project conducted by Elephant Butte Irrigation District (EBID).

The authors generously acknowledge the Technical Committee members for their continued support. The project team is in debt to the Project Manager of El Paso Water Utilities, Mr. Michael Fahy, for his management and support. Special thanks go to Dr. Conrad Keyes, Jr. for his thorough review and valuable comments. Lastly, the project team sincerely thanks the survey respondents for their participation.

Project Background

Texas A&M University (TAMU) and New Mexico State University-New Mexico Water Resources Research Institute (NMSU-NMWRRI), entered into a Memorandum of Agreement (MOA) in 2000 permitting their scientists to collaborate on research dealing

with common water resources problems in south central New Mexico and west Texas. This MOA was extended by mutual consent in November, 2005. Its objective is to facilitate and promote joint and cooperative water resources related research, extension, and outreach programs of mutual interest to both institutions.

The Paso del Norte Watershed Council Coordinated Water Resources Database and GIS Project (hereafter referred to as the Coordinated Database Project or CDP) is a specific effort that is being pursued under this cooperative working arrangement. Project cooperators were successful in securing funding from the U.S. Department of Interior Bureau of Reclamation (USBR) under its Water 2025 Challenge Grant Program for a project entitled, **Installation of River and Drain Instrumentation Stations to Monitor Flow and Water Quality and Internet Data Sharing**. This project is one of three linked projects submitted by water resource management agencies in the Paso del Norte region, and the project seeks to improve the ability of these agencies to generate, store, and share regional water resources data.

As part of the **Installation of River and Drain Instrumentation Stations to Monitor Flow and Water Quality and Internet Data Sharing** project, researchers at NMSU and TAMU have cooperated on a User Needs Assessment effort related to the CDP. Early in the development of the Database project, staff conducted research into how best to compile, store and share water resource data through the coordinated use of GIS and Web-based technologies, and the current project website (available at <http://river.nmsu.edu/website/pdnwc4/index.htm>) is based on this initial research. During the discussions supporting the USBR project proposals, researchers involved in the Coordinated Database Project decided that a detailed needs assessment of current users of the project website and also other interested parties would be very beneficial to gauge how the current project was being received and how it could be improved. This document reports on the activities undertaken in this effort and also details the outcomes of this assessment effort.

Tasks Involved in the User Needs Assessment Effort

As was detailed in the initial proposal to the USBR and the relevant Task Order and Scope of Work documents between the El Paso Water Utilities, TAMU, and NMSU, the task to be undertaken in this work is to develop and conduct a User Needs Survey for the Rio Grande Project area, focusing on the identification of new data sets of interest, enhanced access mechanisms, and other suggestions to improve the CDP website. The specific activities that were undertaken in the project are detailed below:

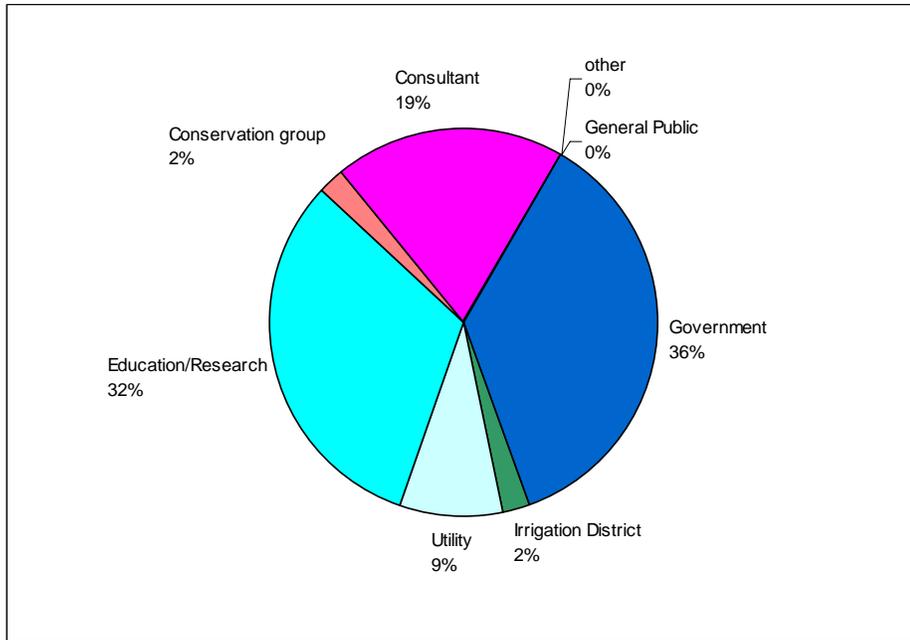
1. Develop a distribution list (EMAIL addresses and physical addresses) by which the survey would be administered, and this list would include regional entities with a potential interest in water related data. Early in the discussion of the survey effort, the researchers decided that the most efficient manner to do this would be through a Web-based tool that would in turn generate a database of responses, and the project developed an EMAIL list of approximately 225 people to whom relevant EMAIL communications were sent.

2. CDP researchers met several times to discuss the specifics of the survey instrument, and several versions of the survey were drafted, reviewed by CDP Technical Committee members, and revised over a two month period of time. Interim drafts of the survey instrument were converted to HTML file format and put up at the CDP Website for testing by CDP researchers. Based on input from the PdNWC Technical Committee, the survey tool was finalized; see <http://wrri.nmsu.edu/pdnwc/survey/survey.html> for the final version, a copy of which is also attached to this document. Dr. Bobby Creel of the NM Water Resources Research Institute then developed the needed computer code that would generate the “mail to” EMAIL reply mechanism and compile the survey responses into a database file for further analysis.
3. Project researchers then developed a cover letter for the survey instrument and sent an e-mail to distribution list members detailed above requesting recipients to visit the CDP website and take the survey. Once connected to the CDP website, the recipient can access the survey form, which includes questions on the types of water-related data that would be most useful to the survey respondents, their type of data sorting and querying capabilities, the preferred format for downloading queried data, plus requests for any other suggestions for improving the usability of the website.
4. Project researchers also reached out to other water resource institutions in the region to “market” the survey effort, and prominent among these was the International Boundary and Water Commission Rio Grande Citizens Forum (RGCF), that meets four times a year in the Las Cruces and El Paso region to discuss current water issues. Dr. Christopher Brown gave a formal presentation to the May 11 2006 meeting of the RGCF in which he updated members on the CDP, gathered contact information on people interested in the CDP, and promoted the survey effort. The researchers followed up on this initial effort by also reminding RGCF members to participate at the 9 August 2006 meeting of the RGCF. Additional EMAIL addresses were also obtained at both RGCF meetings for interested parties not originally contacted.
5. The survey form has been available for access on the CDP website since July of 2006, and the researchers also sent out 2 reminder EMAILs to the members on the distribution list during July and September. The project will keep the form up on the Web as part of the CDP website for future access; the results to date are reported below.

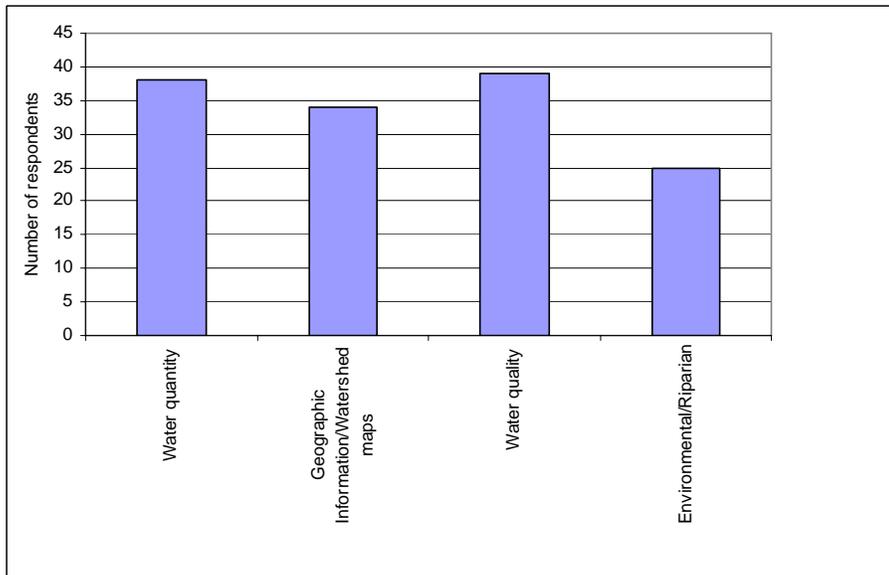
Outcomes of the User Needs Assessment Effort

As of November 13, 2006, the project received 47 responses to the survey, which equates to a response rate of approximately 21%. The charts and tables below summarize the responses obtained, after which the authors provide some discussion of these results.

1. What is the nature of your business?

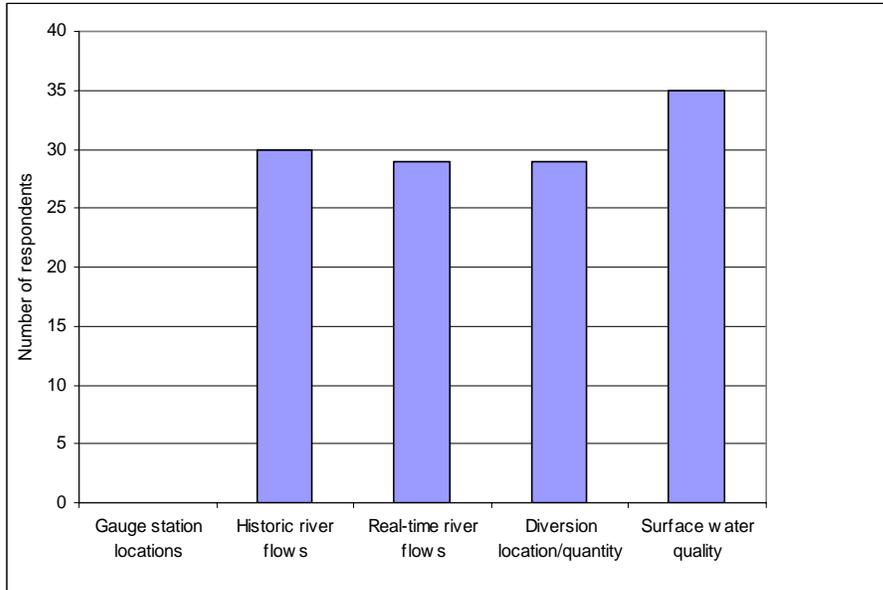


2. What types of general, water-related information are you interested in accessing (Check all that apply)?

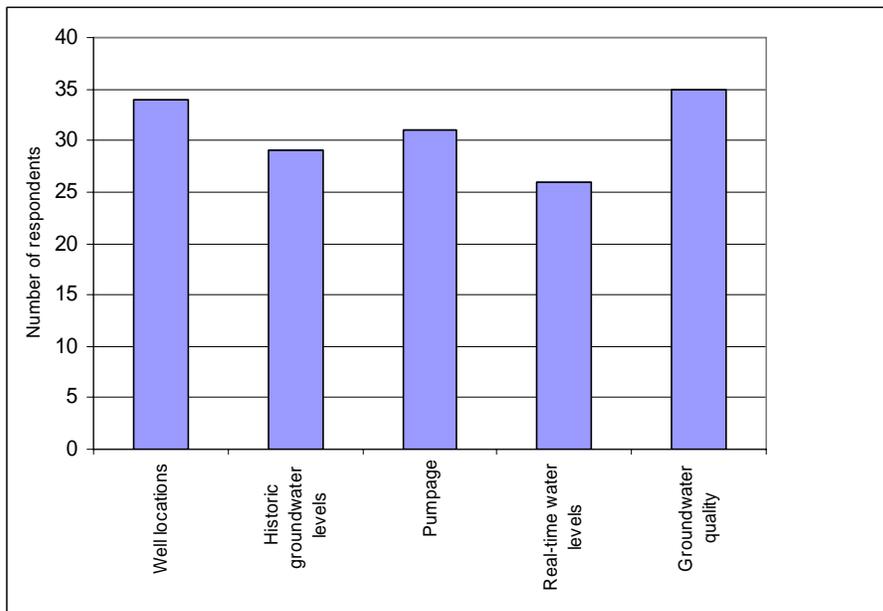


3. What water resource information are you most interested in accessing (Check all that apply)?

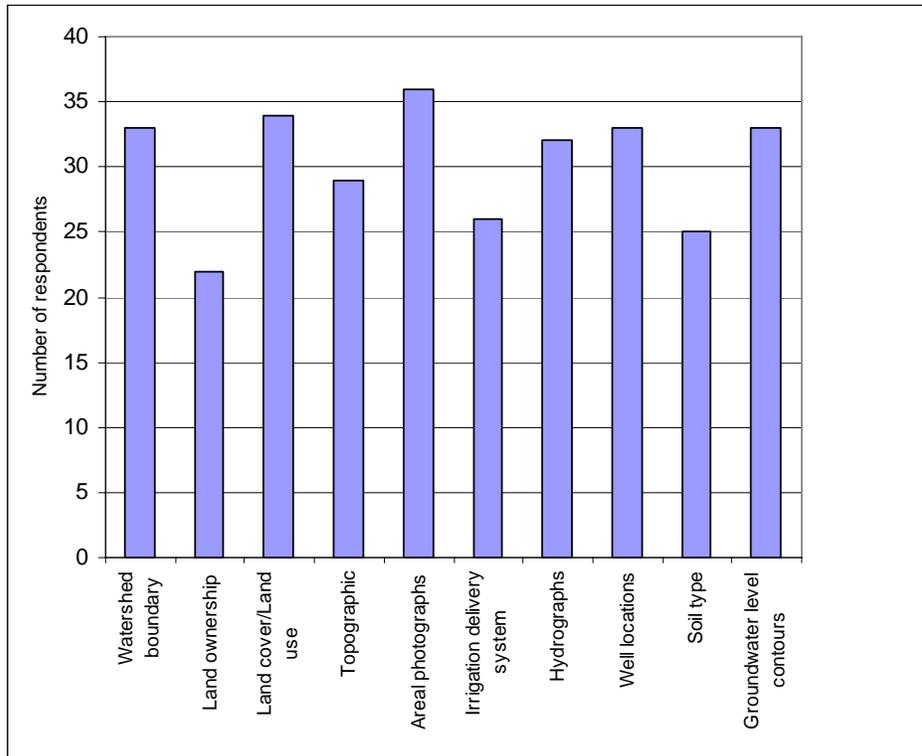
Surface Water Data



Groundwater Data



Graphic/Mapping Information



Others, please specify:

International boundary
Aquifer formation

4. Are you aware of the PdNWC Coordinated Water Resources Database and GIS?

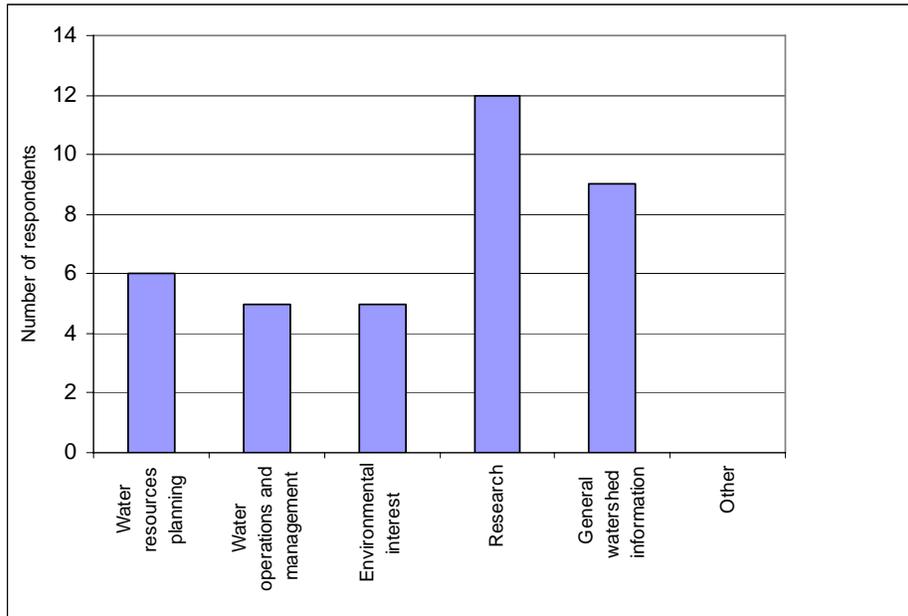
Yes 62%
No 38%

5. Have you used the PdNWC Coordinated Database and GIS website before?

Yes 30%
No 70%

If no, please skip to question 15. The website is available at
<http://river.nmsu.edu/website/pdnwc4/index.htm>

6. What are you using this database/website for? (Check all that apply).



7. Please describe your experience using the Coordinated Database and GIS website.

Excellent	4%
Good	4%
Acceptable	6%
Difficult	0

Please comment

None
 No Experience to Date
 Difficult to load

8. Please rate the organization of materials on the database/website.

Excellent	6%
Good	21%
Acceptable	9%
Needs Improvement	0

Please comment

None

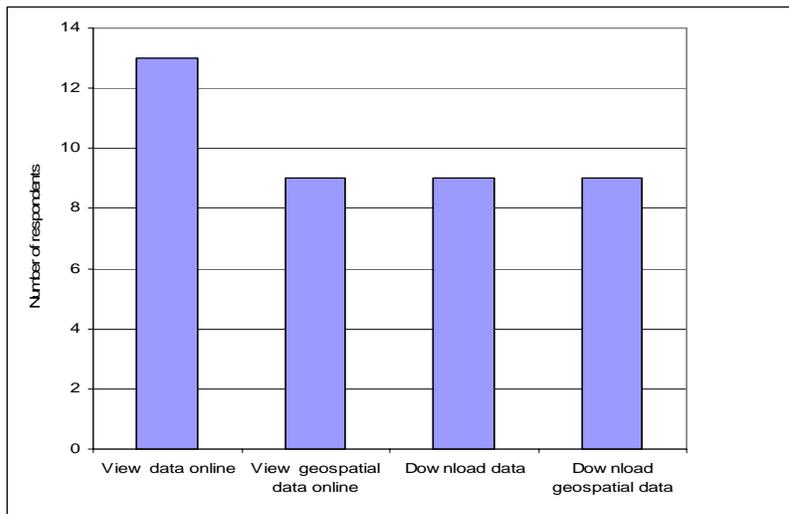
9. Which features of the Database and/or GIS do you find most useful? (List or describe).

- ArcIMS links to data
- Clicking on a location and getting data and/or information about the site in question
- Real time River Flows and Water Quality
- Interactive mapping
- Well data from Mexico
- ArcIMS
- Well locations
- One location for water resources data
- Variety of the data sources
- Data

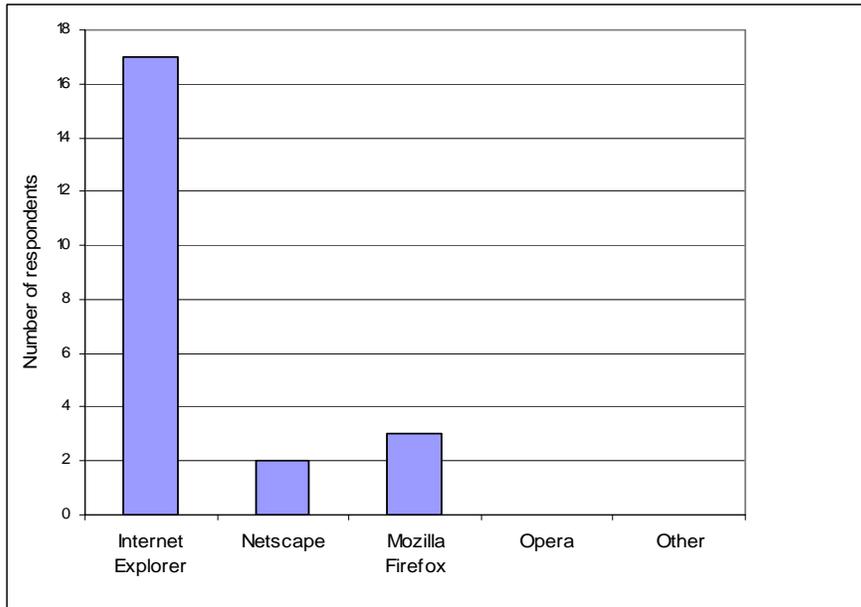
10. Which features would you like to see expanded or improved? (List or describe).

- More metadata
- Toggling between data sources is cumbersome
- Data query
- Water quality information
- More datasets
- Groundwater quality data; aquifer formations
- Irrigation diversions and return flows
- More surface and groundwater quality data
- More data

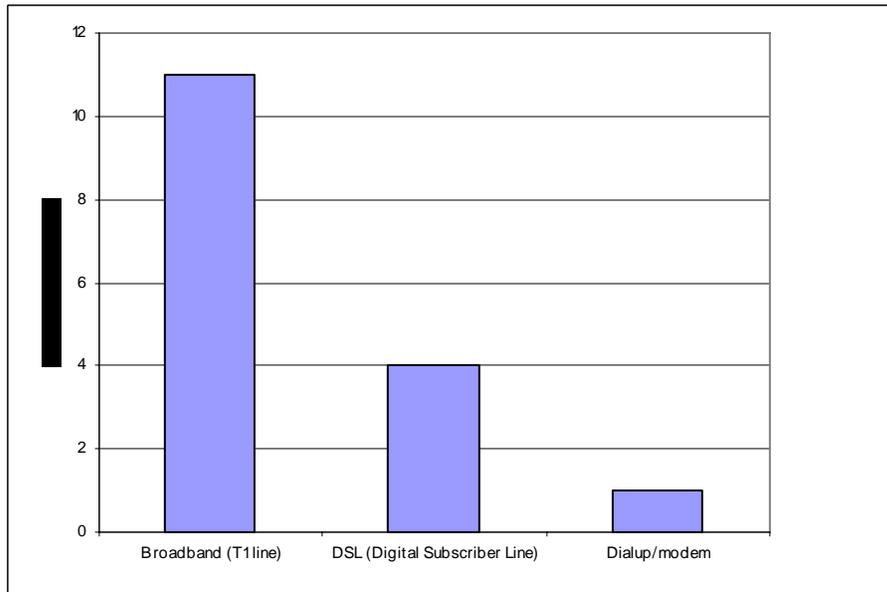
11. What is your method or mode of use of the Database? (Check all that apply).



12. What browser are you using? (Check all that apply)



13. What type of Internet connection are you using?



14. Please describe your experience downloading data or graphic/maps

Excellent	9%
Good	6%
Acceptable	6%
Difficult	2%

Please comment

Have not downloaded data yet.
Could not download the NM DOQQs.
T1 is ok.

15. Are you aware of the Upper Rio Grande Water Operations Model (URGWOM)?

Yes	62%
No	38%

Discussion of Responses to User Needs Assessment

Observed Trends in Survey Responses – Several common trends in survey responses are readily apparent when reviewing the summary graphs and tables describing the survey results (See Table 1 for details). The response rate of approximately 21%, although a bit less than was hoped, is consistent with response rates on “mail out, mail in” surveys. Also, the Coordinated Database Project (CDP) is used on a regular basis by a nearly even split among representatives from government agencies, academic institutions and consulting firms. Reference and downloading of water flow and quality information are useful to CDP users, along with ground water pumping rates and surface flow diversions. Most useful features cited for the CDP include the linkage to maps, reporting of “real time” flows and water quality, and well and river diversion locations. The organization of material in the CDP is rated generally “good” and may only require slight improvement. Broadband technology is the most common type of Internet connection, and some individuals may experience difficulty accessing the web page and the survey using dial up Internet service. Interactive linking to maps is a definite asset along with posting of the locations for river diversions and pumping wells. Finally, the majority of the survey respondents are aware of URGWOM.

Recommended Improvements - The respondents in some cases provided specific recommendations for improvements to the CDP, as noted in the summary above. In general, it appears that the program could be used more frequently for downloading of data. More frequent use of the CDP could benefit the irrigation districts and representatives of the agricultural community. Addition of data sorting and query capabilities was requested by respondents, and this is a specific task that Project staff members have already initiated. Only a small number of respondents rated the overall quality of their experience using the web site. This indicates that the questions involved may not have been worded properly, or that those using the CDB are satisfied with its performance. Follow up discussions with the users may clarify this issue.

Finally, several requests were made for posting of more water flow and quality information, especially for river and agricultural return flows. This condition will be improved with the addition of several more flow and water quality gages by Elephant Butte Irrigation District (EBID) in both the river and in major agricultural drains in the New Mexico portion of the Rio Grande Project (<http://www.doi.gov/water2025/images/grants-05.pdf>). These additional gages are being installed now as part of this Water 2025 Project, and the data that these gages will generate will be included in the CDP website. Participation by the El Paso County Water Improvement District #1 to include similar installations in the TX portion of the Project would provide additional such data in that portion of the Rio Grande Project area.

In the last three months of 2006, Project staff reviewed the above suggestions in more detail and worked on enhancements to the CDP website where possible. A final Technical Memorandum detailing these changes will be issued to interested parties at EPWU, NMSU, TAMU, USBR, and EBID as the deliverable for this part of the project.

Table 1 Summary of User Needs Survey

(Total of 47 Responses)

As of Nov. 13, 2006

Questions	Type of Questions	Response Description
1. What is the nature of your business?	Choose from Selection	Government, education/research and consultant are three major groups
2. What types of general, water-related information are you interested in?	Choose from Selection	Equal split: maps, water quantity /quality, environ.
3. What water resource information are you most interested in?	Choose from Selection	Evenly split among water quality, diversions, pumpage, and surface flows
4. Are you aware of the PdNWC Coordinated Water Resources Database and GIS?	Yes or No	2/3 of participants are aware of the DB and GIS.
5. Have you used the PdNWC Coordinated Database and GIS website before?	Yes or No	1/3 of participants used the website
6. What are you using this database/website for?	Choose from Selection	A majority of 1/3 for research
7. Please describe your experience using the Coordinated Database and GIS website.	Rated Scale	Half of respondents report good to excellent experience.
8. Please rate the organization of materials on the database/website.	Rated Scale	“Good” was the most common response.
9. Which features of the Database and/or GIS do you find most useful?	Fill in the Blank	ArcIMS links to data and interactive mapping; access or sharing of real-time flow and water quality data; Well and data locations identified

10. Which features would you like to see expanded or improved?	Fill in the Blank	More water quality for both surface and groundwater; add data query. Add irrigation return flows and diversions. Also include more data description in metadata files.
11. What is your method or mode of use of the Database?	Choose from Selection	Even split between viewing and download.
12. What browser are you using?	Choose from Selection	75% use Internet Explorer
13. What type of internet connection are you using?	Choose from Selection	Broadband (T1) most common.
14. Please describe your experience downloading data or graphic/maps	Rated Scale	Majority rated good to excellent.
15. Are you aware of the Upper Rio Grande Water Operations Model (URGWOM)?	Yes or No	62% of participants are aware of the URGWOM.

Appendix

Letter of Invitation Sent to Members of the Distribution List

Dear interested party,

As you may be aware, the flow and water quality of the Rio Grande is measured and recorded at several points by various groups from Elephant Butte Dam, New Mexico down to Fort Quitman, Texas. Separate measurements are collected by federal agencies (USBR, USGS, IBWC), irrigation districts (EBID & EPCWID#1), El Paso Water Utilities, City of Las Cruces, and others. Historically, there has been little or no coordination or a convenient method to access data from these numerous sources. This absence of coordinated access and sharing of real-time and historical data may lead to unnecessary duplication of effort and wasted resources.

The [Paso del Norte Watershed Council](#) (PdNWC) developed the [Coordinated Water Resources Database & Geographic Information System](#) (GIS) to coordinate, compile and provide timely Internet access to information for use by water management organizations, stakeholders and scientists. The Coordinated Water Resources Database & GIS is being developed by the Paso del Norte Watershed Council through collaboration of university scientists, and cooperation of Federal and State agencies, irrigation districts and water management and user organizations. Funding for this project has been provided by the El Paso Water Utilities, the U.S. Bureau of Reclamation, and the U.S. Army Corps of Engineers.

To better understand the experience of people accessing the Paso del Norte Water Resources Database and GIS and to identify additional user needs for water resources data and information, we ask you to provide your input and comments by taking a short survey. The survey is available on line at <http://wrri.nmsu.edu/pdnwc/survey/survey.html> and takes just a few minutes to complete. If you are not the appropriate person in your organization to answer this survey, please forward this EMAIL to the appropriate person. If you do not wish to access the survey on line but are still interested in providing feedback, please contact Dr. Ari Michelsen at a-michelsen@tamu.edu for a hard copy of the survey, which you can then complete and return to the PdNWC via conventional postal service.

Thank you in advance for your participation and input.

Dr. Christopher Brown (brownchr@nmsu.edu)
Department of Geography - New Mexico State University

Dr. Zhuping, Sheng (z-sheng@tamu.edu)
Texas A&M Agricultural Experiment Station - El Paso, Texas

Co Chairs of the Paso del Norte Watershed Council
Coordinated Water Resources Database and GIS Technical Committee



Paso del Norte Watershed Council

Water Resources Database and Geographic Information System

User Needs Survey

As you may be aware, the flow and quality of the Rio Grande is measured and recorded at several points by various groups from Elephant Butte Dam, New Mexico down to Fort Quitman, Texas. Separate measurements are collected by federal agencies (USBR, USGS, IBWC), irrigation districts (EBID & EPCWID#1), El Paso Water Utilities, City of Las Cruces, and others. Prior to this collaborative program, there has been little or no compilation, coordination or convenient method to access data from these numerous sources. Each organization collects information for their individual mission. Even when information is shared, it may not be done in a timely manner. This absence of coordinated access and sharing of real-time and historical data may lead to unnecessary duplication of effort and wasted resources.

The Paso del Norte Watershed Council (PdNWC) Coordinated Water Resources Database & Geographic Information System is designed to coordinate, compile and provide timely Internet access to information for use by water management organizations, stakeholders and scientists. The Coordinated Water Resources Database & GIS is being developed by the Paso del Norte Watershed Council through collaboration of university scientists, and cooperation of Federal and State agencies, irrigation districts, and water management and user organizations.

The purpose of this survey is to better understand awareness and ease of use of the Paso del Norte Water Resources Database and GIS and identify additional user needs for water resources data and information. The survey takes just a few minutes to complete. Thank you for your participation.

Sincerely,

Dr. Susan Watts, Chair
Julie Maitland, Co-Chair
Paso del Norte Watershed Council

1. What is the nature of your business?

- | | | |
|---|---|--|
| <input type="checkbox"/> General Public | <input type="checkbox"/> Government | <input type="checkbox"/> Irrigation District |
| <input type="checkbox"/> Utility | <input type="checkbox"/> Education/Research | <input type="checkbox"/> Conservation group |
| <input type="checkbox"/> Consultant | <input type="checkbox"/> other | |

2. What types of general, water-related information are you interested in? (check all that apply)

- Water quantity
- Geographic Information/Watershed maps
- Water quality
- Environmental/Riparian

3. What water resource information are you most interested in?
(Check all that apply)

Surface Water Data

- Gauge station locations
- Historic river flows
- Real-time river flows
- Diversion location/quantity
- Surface water quality

Groundwater Data

- Well locations
- Historic groundwater levels
- Pumpage
- Real-time water levels
- Groundwater quality

Graphic/Mapping Information

- Watershed boundary
- Land ownership
- Land cover/Land use
- Topographic
- Aerial photographs
- Irrigation delivery system
- Hydrographs
- Well locations
- Soil type
- Groundwater level contours

Others, please specify

4. Are you aware of the PdNWC Coordinated Water Resources Database and GIS?

Yes No

5. Have you used the PdNWC Coordinated Database and GIS website before?

Yes No

If no, please skip to question 15.

If no, the website is available at: PdNWC Data Distribution and Download Site

6. What are you using this database/website for? (Check all that apply)

- Water resources planning
- Environmental interest
- General watershed information
- Water operations and management
- Research
- Other, please specify



7. Please describe your experience using the Coordinated Database and GIS website.

Excellent Good Acceptable Difficult

Please comment



8. Please rate the organization of materials on the database/website.

Excellent Good Acceptable Needs Improvement

Please comment



9. Which features of the Database and/or GIS do you find most useful? (List or describe.)



10. Which features would you like to see expanded or improved? (List or describe.)



11. What is your method or mode of use of the Database?(Check all that apply)

- View data online
- Download data
- View geospatial data online
- Download geospatial data

12. What browser are you using?(Check all that apply)

- Internet Explorer Netscape Mozilla Firefox Opera Other

13. What type of internet connection are you using?

- Broadband (T1 line) DSL (Digital Subscriber Line) Dialup/modem

14. Please describe your experience downloading data or graphic/maps

- Excellent Good Acceptable Difficult

Please comment



15. Are you aware of the Upper Rio Grande Water Operations Model (URGWOM)?

- Yes No

This concludes the survey. Thank you for your participation. Please click the submit button below. If you have any technical questions or would like to make additional comments or suggestions, please contact us.

Program Support Acknowledgements:

The Paso del Norte Watershed Council Coordinated Water Resources Database and GIS are sponsored in part by the USBR Water 2025 Challenge Grant Program (05-FC-40-2392), El Paso Water Utilities and the U.S. Army Corps of Engineers, Albuquerque Office.