

Rio Grande Basin Initiative

OUTCOMES

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In this issue

Interactive Mapping

NMWRRI develops 'sister' Web sites for New Mexico and Texas

2

Market-Based Approach to Conservation

Management of water shortages through water transfer mechanisms

3

Pecanigator[®]

Improving irrigation efficiency in New Mexico pecan production

4

Event Updates

Speakers selected to address quality and quantity of river flows; and Congressman Bonilla recognized at Uvalde Water Day

5

Keeping the Rain Out

Evaluating 60-day drought survival in turfgrass

6

Faces of RGBI

Financial support role of NMSU bookkeepers; and NMSU "water guy"

7

Texas A&M Agriculture

New Mexico State University
College of Agriculture and
Home Economics

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<http://riogrande.tamu.edu>

Interactive Mapping

NMWRRI develops 'sister' Web sites for New Mexico and Texas

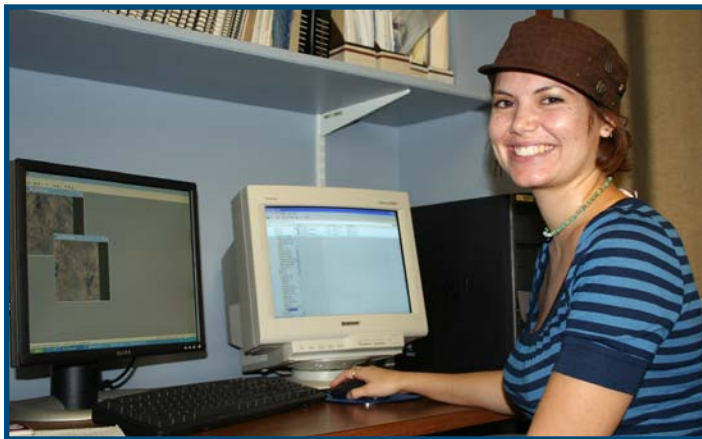
by
Sara Ash

New Mexico Water Resources Research Institute (NMWRRI) and Texas A&M University Spatial Sciences Laboratory (SSL) are working on a joint Rio Grande Basin Initiative (RGBI) project to develop sister Web sites which will provide interactive mapping and analytical services for both states.

The SSL currently has several products serving the needs of Texas counties included in the RGBI. Similar mapping and analysis services are being developed for New Mexico RGBI counties under the auspices of NMWRRI.

To expedite the progress of the New Mexico project, the SSL provided NMWRRI with the programs and configuration files developed for Texas. NMWRRI will modify the SSL system for use in New Mexico in two phases. The first phase of development will incorporate environmental and natural resources data, the second socioeconomic and health-related data. Dr. Bobby Creel, NMWRRI associate director, manages the project, and Susanna Glaze, NMWRRI GIS technician, collects data and implements the programs.

"The project is now in the first phase," Glaze said. "Right now we're gathering data, the bulk of which is digital imagery." Glaze will collect data for all the counties in New Mexico which have some area in the Rio Grande drainage.



Sara Ash works to bring the RGBI and SSL Web sites together as sister Web sites.

"This means we will include 27 of New Mexico's 33 counties into the system," Creel said. "We had data for the nine main-stream counties, but they were from 1992 and 1996. When we decided to include more counties, we wanted to gather new data for 2005."

This has delayed the project somewhat, but Glaze has been working diligently to complete data acquisition. She conducts web searches for data, mostly on government Web sites. Once she finds what she needs, she downloads and organizes it.

"I am focusing on the Lower Rio Grande Valley right now, because there is a large amount of data to download," Glaze said. "Downloading is time-consuming, because the file sizes are large."

Most of the information can be found online, but on occasion she cannot find what she needs. "The EPA listed three toxic release inventories without coordinates," Glaze said. "I couldn't find the coordinates anywhere online. I took the GPS down to the Santa Teresa area, found the sites myself and plotted the points," she laughed about her fieldwork.

Once all data have been collected, Glaze will use ESRI's ArcIMS software to provide the interactive mapping services online.

"I will set up a geodatabase and map, then load them into the ArcIMS software," she said.

"The ArcIMS systems that we develop are quite easy for the public to use," Creel added. The counties are clickable, and the maps are self-explanatory. The accessibility and simplicity of the systems mean that people with average computer skills can use the maps without any extra training or software.

Once the mapping service is online, researchers, stakeholders and the public will have access to environmental data, such as superfund sites; natural resources data, such as digital orthophoto quads; socioeconomic data, consisting of Census of Agriculture and Census Bureau information; and health-related data, including medical facilities and Department of Health indicator information.

"Right now we are focusing on environmental and

See **NMWRRI** on page 5

Market-Based Approach to Conservation

Management of water shortages through water transfer mechanisms

by
Nargiza Rakhimova

Large dams and reservoirs built on major rivers to mitigate water shortages are no longer economically or environmentally feasible, however, the competition for water is increasing.

Socioeconomic and political aspects of water conservation are current hot topics, as many people realize the importance and inherent difficulty in allocating this scarce resource among the diverse range of water users. One way to address this issue is to encourage water-users to improve water-use efficiency through a market-based transfer mechanism where price is a result of demand and supply interaction.

A three-year research program to assess the potential for the development of a water market in the Lower Rio Grande Basin of New Mexico and to determine what type of water transfer mechanisms would be most effective in the basin, has been initiated by a team of investigators under the supervision of Ereney Hadjigeorgalis, assistant professor at New Mexico State University.

The program was developed based on a three-stage evaluation aimed to:

- 1) Identify economic disincentives to water trades in the current institutional framework for both short-term trades and permanent transfers of water-use-right titles;
- 2) Determine the factors that influence farmers' willingness to participate in water markets and the specific type of water transfer mechanism that is most suitable; and
- 3) Design a working draft of a water transfer mechanism that would reduce wasted water and encourage conservation by efficiently allocating scarce water resources among farmers during times of drought, while still protecting third party interests specific to the basin.

Results obtained from research to date are encouraging. Findings show that while farmers were interested in participating in water markets, they prefer short-term transfer mechanism and spot water markets over water banks, thereby giving them

the ability to negotiate price between transacting parties. In addition, there was little interest in 'option markets', due to their complexity and institutional constraints, i.e., the water users currently do not have secured water rights and well-defined property rights to water.

This year, the research program is focused on the current institutional framework in the basin such as transaction costs associated with water leasing and sales, and the potential impact on third parties from increased water transfers. These findings will assist the program in determining various aspects and structures of the water markets and find the most appropriate approaches in the Rio Grande Basin case.



A wide range of municipal, industrial, agricultural, recreational and other water-users must factor into a water marketing scheme.

Pecanigator[©]

Improving irrigation efficiency in New Mexico pecan production

by
Craig Runyan

The Pecanigator[©]

A Pecan Irrigation Calculator

A simplified, handheld calculator to help determine when established pecan orchards should be irrigated is being developed by a team at NMSU.

The 'Pecanigator' is a Rio Grande Basin Initiative funded effort targeting "primarily pecan growers whose enterprise is an important part of their income," said John Mexal, NMSU horticulturist and leader for the project.

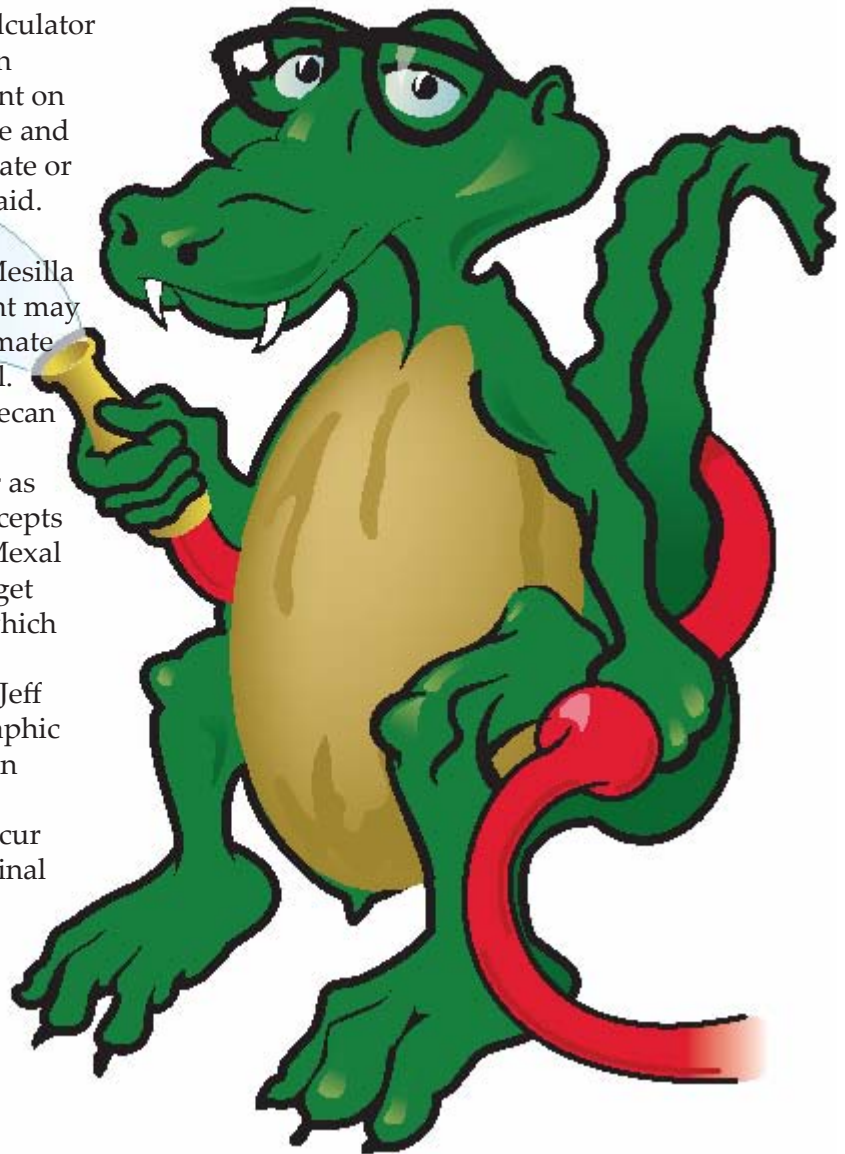
Although using the irrigation scheduling calculator could be useful to the small and medium pecan producer, Mexal added that "more management on their part may be required with additional time and labor." Small scale producers often under-irrigate or schedule irrigation intervals too far apart, he said.

The current Pecanigator prototype is being developed from climate data collected in the Mesilla Valley of New Mexico. Additional development may expand its usefulness to other areas if local climate and soil data were incorporated into the model.

Richard Heerema, New Mexico Extension pecan specialist, is a part of the team developing this irrigation tool. Heerema views the Pecanigator as an "introduction, for some growers, to the concepts behind science-based irrigation scheduling." Mexal concurs, adding that "the long-term goal is to get more producers using real-time information which will increase irrigation efficiency even more."

Other members of the Pecanigator team are Jeff Kallestad, research specialist; Jerry Downs, graphic artist; Ted Sammis, state climatologist; and John White, Dona Ana Extension agent.

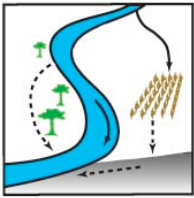
Pilot testing of the device prototypes will occur over the next few months. Distribution of the final product is expected to begin by March 2007.



Event Updates

Speakers selected to address quality and quantity of river flows

by
Sara Alarcon



The Rio Grande Basin Initiative will address quality and quantity of river flows at the *River Terrace & Flood Plain Hydrology* symposium Feb. 28 and March 1 at Hotel Encanto, Las Cruces, NM.

The main focus of the conference will be on connections between surface water and groundwater sources in river valley ecosystems. The symposium will assess the state of science in river hydrology, river flow and water quality linkages. The convention will also examine integrative measurement and modeling methods, and share research to help identify knowledge gaps and future research directions.

Of particular interest are situations where surface water moves underground and subsequently returns to the river. The symposium will evaluate implications of existing research and chart future directions for needed work, as well as provide a better understanding of river valley hydrology and related management strategies.

Contributing to the symposium are speakers from the Universidad de Concepcion, New Mexico Tech, Sandia National Laboratory, New Mexico State University, Sul Ross State University and the U.S. Environmental Protection Agency.

The Web site is now available for registration and additional information concerning the Symposium. Please visit <http://nmwater.nmsu.edu> for more information.

Congressman Bonilla recognized at Uvalde Water Day

by
Danielle Supercinski



The Texas A&M University Agricultural Research and Extension Center at Uvalde held a Water Day on Monday, Oct. 16 to recognize Representative Henry Bonilla's leadership on critical water issues.

Speakers highlighted water programs implemented under the Rio Grande Basin Initiative and announced the new Beef Improvement program headquartered at the Uvalde Center.

Walt Smith, appropriations associate for Representative Henry Bonilla, met with local citizens and producers earlier that afternoon. Dr. Bill Holloway, center resident director of research; Congressman Bonilla; Dr. Elsa Murano, vice chancellor, dean of agriculture and life sciences and director of Texas Agricultural Experiment Station for Texas A&M University; and Dr. Ed Smith, associate vice chancellor for agriculture and life sciences, spoke at the meeting.

Dr. Leo Sayavedra, vice chancellor for academic and student affairs of Texas A&M University System; John Bellinger, chairman of the U.S. Meat Exportation Federation; and Dr. Wendy Gramm and Ida "Weisie" Clement Steen, both members of the Texas A&M Board of Regents, were also in attendance and said a few words.

"We need to make sure we are doing everything we can through science to ensure we are protecting this precious natural resource," Murano said. "I believe the Rio Grande Basin Initiative will help us maximize the availability of this precious natural resource."

NMWRRI

continued from page 2

natural resources data," Creel said. "In the second phase of the project, we will start gathering health data and incorporating it into the system."

The project covers such a "wide scope of

information. It will be useful to a lot of people," Glaze said.

The mapping service will be hosted from one of the WRRRI servers at <http://water.nmsu.edu>.

Keeping the Rain Out

Evaluating 60-day drought survival in turfgrass

by
Danielle Supercinski

The Rio Grande Basin Initiative helped establish a new, state of the art facility for determining the 60-day drought survival of various established turfgrass species and cultivars to provide background data for a San Antonio Water System (SAWS) ordinance that will go into effect in January 2007.

"The Rio Grande Basin Initiative supported this work through the time and effort of Extension associates Chris Braden, David Flahive and Wayne LePori who provided design and construction oversight," said Dr. Guy Fipps, Extension agricultural engineer and Irrigation Technology Center director. "This (rainout shelter) facility will be used for years to come to determine irrigation requirements of landscape and horticultural plants."

Construction of a 5,000 square foot rainout shelter at the research site was completed on July 25, 2006. The rainout shelter will cover the research plot area during times of rainfall to maintain a 60-day summer drought period. Two Campbell Scientific rain gauges are mounted 6 feet off the ground on both sides of the storage shed. When both rain gauges detect 0.01 inches of rain, the rainout shelter will deploy; in less than two minutes it will be able to cover the turf test plots.

San Antonio's new ordinance will require new home construction to have at least 4 inches of topsoil in place prior to lawn establishment and plant grasses that are most likely to survive a 60-day drought.

"The ordinance will provide some drought capacity for homeowners who have very little control over the landscape and soil put in by their builder before they take over the house," said Karen Guz, director at SAWS Conservation Department.

Dr. Chris Braden, Extension associate at the Irrigation Technology Center at San Antonio, said, "The addition of a high quality topsoil will increase the water holding capacity and rooting depth, thus increasing the ability to better withstand long-term



drought conditions."

Grasses at the research site are planted on 4 inches of native soil over an impermeable plastic barrier to simulate the 4-

inch topsoil requirement in the SAWS ordinance. In addition, grasses are planted on native soil without restriction to rooting to represent drought survival on unrestricted soil depth.

Plots have been sodded with 25 different turfgrasses solicited by SAWS and the Turfgrass Producers of Texas (TPT) on the basis of either the grass having a presence in the San Antonio market or as a result of a producer wishing to pay to enter a grass in the test. These grasses have been evaluated from their planting date in September 2005 through the July 22, 2006, establishment period. Data is being collected weekly for turfgrass quality, density, color and leaf firing due to moisture stress. SAWS will then use this data to formulate an initial list of "drought-tolerant" grasses.

"The drought study started on July 23, 2006, and the shelter will be in operation mode for 60 days," Braden said. After the 60-day drought period, the grasses will be allowed to recover with irrigation for another 60 days.

Braden and other Texas Cooperative Extension soil and crop sciences and agricultural engineering faculty have entered into an agreement with SAWS Conservation Program and the TPT for a two-year research project.

"Next year we will repeat the study and the shelter will once again be in operation mode for 60 days," Braden said. The second-year plot area is currently under construction for an anticipated sodding in mid-September 2006.

Additional funding for supplies and materials were provided by SAWS and TPT as part of the 60-day drought recovery program.

For more information and pictures, please visit <http://itc.tamu.edu/rainout.php>.

Faces of RGBI

Financial support role of NMSU bookkeepers

by
Nargiza Rakhimova



(L to R) Sally Baeza, Pat Zapien, Mary Acosta, Donna Ebler, Sandra Day, Eva Cortez, Kristine Kitchens, Beth Chorey and Leeann DeMouche.

Bookkeepers play an important role working in partnership with other staff and faculty on sponsored accounts. Often in daily program activities, however, our bookkeepers are often 'left out of the loop.' Craig Runyan, New Mexico RGBI project coordinator, said it is "sometimes difficult for bookkeepers to establish a rapport with staff professionals due to time constraints.

"It's useful to keep track of everyone's activities, and often staff forgets that it is important to keep the bookkeeper apprised of what they're doing," said Runyan when greeting New Mexico State University (NMSU) staff at the Department Bookkeepers Luncheon, organized as a part of New Mexico's RGBI project activities. "It should be recognized that bookkeeping is far more than simply entering data."

As every other successful project or business, the RGBI project at NMSU owes its ceaseless progress in implementing its various project components, in part, to the outstanding performance of the department's bookkeepers. They provide key support links in the effective management of all RGBI projects. Their distinguished performance is characterized by their flexibility and ability to adjust to unusual circumstances and communicate with the other members of the project and/or research staff. Their goal is to resolve financial issues without detrimental consequences or delays to the research. Improved communications and closer relations with faculty and technical staff increases support and appreciation for the role bookkeepers have in the project. Department bookkeepers are indeed an important link between research efforts and RGBI's progress in the region pursuing the goal to ensure efficient irrigation for water conservation in the Rio Grande Basin.

NMSU "water guy"

by
Leeann DeMouche



On the New Mexico State University campus R. Craig Runyan is known as the "Water Guy." Since 1990, he has served as Extension water quality specialist in the NMSU Extension Plant Sciences Department, and currently devotes his time as Water Task Force Coordinator and state director of the Southern Region Watershed Resource Management Project. His professional interests include: watershed management, pollution risk assessment and water resources development.

Craig began his career in agriculture growing broilers in East Texas while earning a bachelor's degree at Stephen F. Austin State University. He taught vocational agriculture in Texas before he joined NMSU's Yemen project in 1981 as a farm manager and mechanization specialist. Craig earned a master's degree in Agricultural and Extension Education at NMSU and was assistant professor of agricultural mechanization.

"Craig has been a great partner and NMSU leader for the Rio Grande Basin Initiative, and his broad knowledge of water and his professionalism have fostered significant project outcomes," said Bill Harris, RGBI project director. "Craig is a pleasure to work with and is a champion of interstate collaborations."

While not working in the water world Craig loves playing with his two boys, working with his bird dogs and enjoys bird hunting – quail being his favorite.

Increasing Irrigation Efficiency in the Rio Grande Basin through Research and Education

Through Extension and research efforts, the Texas Agricultural Experiment Station and Texas Cooperative Extension and counterparts at New Mexico State University are implementing strategies for meeting present and future water demands in the Rio Grande Basin. These strategies expand the efficient use of available water and create new water supplies. This federally funded initiative is administered by the Texas Water Resources Institute and the New Mexico State University Water Task Force with funds from the Cooperative State Research, Education and Extension Service.



Rio Grande Basin Initiative Outcomes
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