



Divining Rod

Vol. XXXI, No. 4 • November 2008

Research Assistant Wins National Turf Award

by Audry Olmsted, NMSU University Communications

A graduate research assistant at New Mexico State University won first place recently at a national conference for her research into how salinity can affect moisture readings in soils.

Elena Sevostianova, with the Department of Plant and Environmental Sciences, won for her poster presentation in the turfgrass category on the “Accuracy of Moisture Sensors in Saline Soils” at the recent National Agronomy Meeting in Houston, Texas.



Elena Sevostianova is from Russia, where she received a B.S. from St. Petersburg State University in 1990. She obtained an M.S. in horticulture from NMSU in 2004. After completing her Ph.D., she hopes to find a research position.

Bernd Leinauer, a specialist in Extension Plant Sciences, Manoj K. Shukla, an assistant professor in the Department of Plant and Environmental Sciences, and Bernd Maier, a viticulturist specialist with Extension Plant Services, assisted Sevostianova on the project.

“Although her poster and work was awarded because of the potential to have an immediate beneficial impact on the turf industry, the work reaches much further than only the turf industry. These sensors can be used also in agriculture where saline groundwater is used for irrigation and salt accumulation needs to be monitored to ensure a healthy crop.” said Leinauer.



page 4 water conference participants take tour



page 5 Bobby Creel receives SCERP award



page 7 faculty, staff, and students garner awards

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Published by
The New Mexico Water
Resources Research Institute

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For the project, a study was conducted at the university to compare the accuracy of five soil moisture sensors at a wide range of salinity levels in two types of soils. The study was funded through the Rio Grande Basin Initiative and through a grant from the New Mexico Water Resources Research Institute.

The objective of the yearlong project was to determine if salinity affects moisture readings of soil sensors in two different types of soil. The researchers tried to determine the salinity threshold at which the sensors failed to measure the moisture accurately.

In the experiment, the soil sensors accurately measured moisture in loamy, or fertile, sand and silt loam soil at salinity levels ranging between 3 and 24 deciSiemens per meter, the measurement used to determine soil salinity. However, all of the sensors needed salinity-specific calibration. It was found that some sensors could also be used to determine soil bulk electrical conductivity.

Sevostianova said she was happy for her win and that her hard work paid off. "It's definitely well-deserved. She worked hard," Leinauer said. "That's definitely something the poster doesn't show."

Sevostianova is not the first graduate to receive first place at the national competition. Previous winners were Casey Johnson and Yoshiaki Ikemura for their presentations on "Turfgrass Establishment with Saline Groundwater" and "Spectroradiometry and Digital Image Analysis of Drought and Salinity Stressed Turfgrasses," respectively.

Sevostianova received a \$300 prize for her winning poster presentation. Of about 260 presentations, 50 percent were poster presentations.

The winning research was all done in a lab. The next step, Sevostianova said, is to now take the experiment out into the field. The outdoor experiments will use two of the five sensors that were found to give the most accurate results, the Acclima and the Turfguard sensor. Sevostianova said they will use the two types of sensors to monitor moisture and salinity at three different soil depths to see how far down the salinity penetrates.

Editor's note: Elena Sevostianova also received the President's Award at the Southwest Turfgrass Association conference in October in Ruidoso. Elena's final report for her 2007 WRRRI student grant, "Investigating Potential Salt Contamination of Aquifers from Irrigated Landscapes" will be posted on the WRRRI website at <http://wrrri.nmsu.edu/research/rfp/studentgrants07/studentresearch07.html>. ♦

2008 Student Research Grant Awards Announced

The New Mexico Water Resources Research Institute (WRRI) has announced recipients of the 2008 Student Water Research Program. This program funds water-related research projects conducted by students at any of New Mexico's universities under the supervision of a faculty advisor.

The program encourages and supports graduate and undergraduate student research in disciplines relevant to water resources issues while assisting New Mexico educational institutions in developing student research expertise and capabilities. Students will begin work on their projects in December, or soon thereafter, with final reports due at the end of a one-year period. Summaries of the projects and final reports are provided on the institute's website at wri.nmsu.edu/research/studentresearch.html. The WRRI website also provides summaries and final reports for previously awarded student projects.

New Mexico State University

Shalamu Abudu, Civil Engineering (advisor: J. Phillip King)

Investigation of Improved Operational Streamflow Forecasting in the Rio Grande Basin

Akash Mummaneni, Civil Engineering (advisor: N. Nirmala Khandan)

Evaluation of Multi-Stage Solar-Powered Desalination System

Sai Reddy Pinappu, Chemical Engineering (advisor: Shuguang Deng)

Composite Membrane for Membrane Distillation Desalination Process

B. V. N. P. Kambhammettu, Civil Engineering (advisor: J. Phillip King)

Designing a Combined Piezometric and Gravity Monitoring Network in the Lower Rio Grande Basin

Jesus Sigala, Plant and Environmental Science (advisor: Adrian Unc)

Assessment of a Novel Source-Tracking Protocol for Evaluating the Significance of Municipal Wastewater Sources on the Microbial Contaminant Levels of Discharged Wastewaters

Nicholas G. Beltran, Biology (advisor: Antonio S. Lara)

Uranium Abatement in Water

Ranganath Potluri, Chemical Engineering (advisor: David Rockstraw)

Removal of Arsenic from Aqueous Solution Using Activated Carbon Prepared from Pecan Shells

University of New Mexico

Nicholas B. Engdahl, Earth and Planetary Sciences (advisor: Gary S. Weissmann)

The Dependency of Anomalous Transport Behavior on Flow Path Orientation

Amy J. Williams, Earth & Planetary Sciences (advisor: Laura Crossey)

Aqueous Geochemistry of the Springs and Wells of the Sevilleta National Wildlife Refuge: Evaluating Hydrochemical Pathways and Microbiology

K.T. LaBadie, Water Resources Program and Community and Regional Planning Program (advisor: Bill Fleming)

From Stormwater Management to Stormwater Integration: The Use of Low Impact Development Techniques in the Albuquerque Region

New Mexico Tech

Jesus D. Gomez, Earth and Environmental Sciences, (advisor: John L. Wilson)

Residence Time Distribution in Dynamically Changing Hydrologic Systems

New Mexico Highlands

Daryl Williams, Natural Sciences (advisor: Edward A. Martinez)

Effects of Copper Sulfate Treatment on Benthic Macroinvertebrates in Peterson Reservoir Sediments

Surface Water Discussed at Annual Water Conference



Albuquerque hosted WRRRI's 53rd Annual New Mexico Water Conference in late October. The transition from using groundwater to surface water to help meet water demands from New Mexico's cities and towns was discussed. Nearly 170 participants attended this year's conference.

A pre-conference tour drew 60 participants. They viewed Albuquerque's new diversion facilities on the Rio Grande, the Water Treatment Plant, and the Bear Canyon Recharge Demonstration Project, the first permitted, operating artificial recharge project in the state.

All presentations will be included in the conference proceedings, which should be ready for distribution in early spring. Proceedings papers will be posted on the WRRRI website as they are completed.



Hernandez Highlights Contributions of Water Experts

2008 Utton Memorial Water Lecture

In the July 2008 issue of the *Divining Rod*, readers were asked if they could identify some of the people who played an important role in the management of New Mexico's water. At the 53rd Annual New Mexico Water Conference, John Hernandez responded to this request in his 2008 Albert E. Utton Memorial Water Lecture wherein he described the colorful characters and events of the past 100 years. The Utton lecture will appear in its entirety in the conference proceedings.



From left:
Steve Reynolds
John Bliss
Ira G. Clark
Francis G. Tracy
Judge Mosey



H. Ralph Stucky
Carl Slingerland
Pete Domenici
Royce Tipton
Jessie Gilmore

SCERP Announces 2008 Awards

NMSU's Southwest Consortium for Environmental Research and Policy (SCERP) has announced research awards of more than \$120,000 for projects related to water quality and groundwater mapping at the New Mexico-Chihuahua border.

Dr. Shuguang Deng, Associate Professor in the Department of Chemical Engineering, received \$68,000 for his project "Improved Alumina-Based Adsorbents for Arsenic and Fluoride Removal." The project is a continuation of an existing SCERP project that aims to develop low-cost solutions for removing naturally occurring arsenic and fluoride from municipal drinking water in Columbus, NM and Palomas, Chihuahua. His first SCERP project examined the use of activated alumina with customized adsorption properties targeted to the type of arsenic found in groundwater in the lower Mimbres Basin. The Basin forms the entire drinking water supply for most of Luna County, NM, including the border communities of Columbus and Palomas.



Shuguang Deng
photo by Darren Phillips

Dr. Deng's second project is designed to modify the alumina for more effective fluoride removal and to study the water chemistry effect of the adsorbent materials. The second project also proposes to identify a low-cost adsorbent suited to the two border communities and to develop an efficient adsorption filtration process for combined fluoride and arsenic removal.

Selected in 2005 for a P3 (People, Planet and Prosperity) award from the EPA for his project "Novel Ru-Ni-S Electrode Catalyst for PEMFC," Dr. Deng has received recognition by EPA for his research into water treatment. In 2005, he was awarded NMSU's Bob Davis Professorship.

The SCERP consortium also awarded Dr. Bobby Creel, Associate Director of the New Mexico WRRI, more than \$55,000 for his project "Water Information Websites for the New Mexico-Chihuahua Border Region." Dr. Creel's project continues the work he began two years ago to provide access in English and Spanish to research reports and findings relevant to water issues in New Mexico and northern Chihuahua.



Bobby J. Creel

With the SCERP project, Dr. Creel proposes to design and host websites that allow English and Spanish speakers access to an integrated summary of research reports on water issues as well as information and data to assist water managers in the region. The project is designed to provide links to digital maps that use newer GIS formats for displaying environmental conditions within watershed, aquifers and water bodies, and links to more detailed information and data.

"A lot of research has been published on this region, but not much of it is easily accessed or visualized," said Dr. Creel. "With this project, we hope to make the initial investment in getting much of the past work online and in a usable format for most anyone to use."

The SCERP consortium provides funding to conduct integrated research projects relevant to the U.S.-Mexico border region. At NMSU, many SCERP awards are targeted to addressing water issues within New Mexico border communities. Consortium partners include the University of Texas-El Paso, Arizona State University, University of Utah, and San Diego State University. Mexican partners include El Colegio de la Frontera Norte, Instituto Tecnológico de Ciudad Juárez, Instituto Tecnológico y de Estudios Superiores de Monterrey, Universidad Autónoma de Baja California, and Universidad Autónoma de Ciudad Juárez. 💧

U.S. Geological Survey Issues Reports

A new report, USGS Circular 1323 titled “Ground-Water Availability in the United States,” has been released. This report examines what is known about the nation’s ground-water availability and places the regional studies by the USGS Ground-Water Resources Program as a long-term effort to understand ground-water availability in major aquifers across the nation. The report is written for a wide audience interested or involved in the management, protection, and sustainable use of the nation’s water resources. The report is available online at <http://pubs.usgs.gov/circ/1323/>.

The USGS, in cooperation with the New Mexico Environment Department, has published Professional Paper 1728 by D. Kirk Nordstrom entitled, “Questa Baseline and Pre-Mining Ground-Water Quality Investigation. 25. Summary of Results and Baseline and Pre-Mining Ground-Water Geochemistry, Red River, Valley, Taos County, New Mexico, 2001-2005.” This report is a summary of a 5-year investigation on geological and hydrological conditions that affect ground water and surface water in the mineralized area of the Red River Valley from the town of Red River to the USGS gaging station at the Questa District Ranger Station of the USDA Forest Service. The size and complexity of the field site necessitated a multidisciplinary approach of gathering field data and utilizing expertise in surface-water hydrology, ground-water hydrology, geology, mineralogy, geochemistry, geomorphology, and geophysics. To view the report on line or to order a hardcopy of the report, go to: <http://pubs.er.usgs.gov/usgspubs/pp/pp1728>.

“Streamflow and Endangered Species Habitat in the Lower Isleta Reach of the Middle Rio Grande” by Ken D. Bovee, Terry J. Waddle, and J. Mark Spears has been published by the USGS. The report is available at: <http://pubs.usgs.gov/of/2008/1323/> and was prepared in cooperation with the Bureau of Reclamation (BOR). San Acacia Dam is located in a reach of the Rio Grande that has been designated as critical habitat for two endangered species, the Rio Grande silvery minnow (*Hybognathus amarus*) and the southwestern willow flycatcher (*Empidonax traillii extimus*). Under present operations, the Rio Grande upstream from the dam is used to convey irrigation water to the Socorro main canal at San Acacia Dam. In order to increase operational flexibility and improve irrigation delivery efficiency, the “Bernardo Siphon” has been proposed to intercept up to 150 cubic feet per second from the Lower San Juan Riverside Drain on the east side of the Rio Grande and transport it under the river into a drainage canal on the west side. Irrigation deliveries to the Socorro main canal would be conveyed by way of the drainage canal rather than the Rio Grande. The objective of this study was to provide BOR and other stakeholders with a tool to evaluate the effects of different operational modes of the Bernardo siphon on habitat for *H. amarus* and *E. t. extimus* in this section of river.

Rio Grande Compact Commission Report

The findings of the 69th annual meeting of the Rio Grande Compact Commission have been published. Contact WRRRI at 575-646-4337 for a copy of the report.

National Competitive Grants Program Request for Proposals

The U.S. Geological Survey in cooperation with the National Institutes for Water Resources requests proposals for matching grants to support research on the topics of water supply and water availability, including studies of possible new sources of supply, improvement of impaired waters to usable quality, conservation of existing sources, and limiting growth in demand.

New Mexico university faculty members are eligible to apply for a grant through the WRRRI. Proposals involving substantial collaboration with the USGS are encouraged. Proposals may be for projects of 1 to 3 years and may request up to \$250,000 in federal funds. Successful applicants must match each dollar of the federal grant with one dollar from non-federal sources.

Although funds for this program have not been appropriated for FY 2009, the USGS is proceeding with the RFP in case an appropriation is made. It is likely that if funding is appropriated, less than \$1 million will be available. The deadline for proposals is February 20, 2009. Those interested in submitting a proposal should contact Bobby Creel at WRRRI (575-646-4337) as soon as possible.

2008 Water Research Symposium

Student Presentation Awards Announced

The annual New Mexico Water Research Symposium provides a forum for water specialists to meet, share their current research, and collaborate for future work. Students meet with experts and professionals in their areas of study, and interested nonspecialist members of the community acquire knowledge about current water research advances.

On August 12, nearly 130 participants gathered at the Macey Center at New Mexico Tech in Socorro. The one-day event featured 27 oral presentations and 35 poster presentations. Abstracts for all presentations are posted at the WRI website at: <http://wri.nmsu.edu/publish/sympabs/abstracts2008.html>.

WRI is pleased to announce the student presentation awards for this year's Water Research Symposium. The Outstanding Student Poster Presentation goes to Carlos Herrera for his poster, *Uranium and Heavy Metals in Macroinvertebrates in the Santa Fe River on the Cochiti Reservation*. Carlos is completing his master's degree at New Mexico Highlands University. His advisor is Professor Michael L. Meyer.

The Outstanding Student Presentation award goes to Marty Frisbee for his oral presentation entitled, *Trends in Stream Chemistry in the Saguache Creek Watershed and its Implications on Conceptual Models of Runoff Generation in Large Watersheds*. Marty is currently pursuing a Ph.D. in hydrology at NM Tech under the supervision of Professor Fred Phillips. He plans to graduate in early 2009. ♦

Kudos

The Border Trade Alliance (BTA) recently elected New Mexico State University's **Erin Martin Ward** as chair for 2008-09. The BTA represents interests of U.S./Mexico border communities, including Las Cruces, El Paso, Deming, Columbus, Santa Teresa and Sunland Park and its mission is to improve the quality of life of U.S./Mexico border residents. The Alliance has partnered with NMSU on several contracts and grants supporting NMSU's research on security, community empowerment, the environment, and economic development.



The New Mexico Geographic Information Council (NMGIC) has awarded **Phani Kambhammettu** the NMGIC SWUG Scholarship. The scholarship covered Phani's participation in the 2008 SWUB Conference in Laramie, Wyoming in October. He presented a paper entitled "Optimal Contour Mapping of Groundwater Levels Using Geostatistical Analyst® in Arc GIS 9.2." Phani is a doctoral student in the Civil Engineering Department at New Mexico State University and is working at the WRI under the direction of Bobby Creel on the Transboundary Aquifer Assessment project.



New Mexico State University professor **Nirmala Khandan** of the Department of Civil Engineering had his desalination project featured as one of the 28 "Best & Brightest" in the December 2008 Genius Issue of Esquire Magazine. The low-cost, low-energy desalination process was described in the June 2007 issue of the *Divining Rod*. Through the years, the WRI has supported Dr. Khandan's projects along with several of his graduate students. He will be completing his current WRI project, "Sustainable Recovery of Potable Water from Saline Waters" in 2009.



Divining Rod

Transboundary Water Crises:

Learning from Our Neighbors in the Rio Grande (Bravo) and Jordan River Watersheds

Presented by
New Mexico Water Resources Research Institute
and
the International Relations Institute, New Mexico State University

January 22-23, 2009
Corbett Center, New Mexico State University
Las Cruces, NM

There is no charge for this conference, but you must register at:
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