

divining rod

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New Mexico Water Resources Research Institute

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10 funded under new proposal process

The WRRRI has funded 10 research projects for the 1988-89 fiscal year for a total of \$209,618. The proposal process was streamlined this year by dividing the process into preproposal and invited proposal stages. The goal of the preproposal stage was to encourage researchers to submit innovative project ideas without having to write detailed proposals. Under this new system, researchers submitted 35 preproposals. The institute's Program Development and Review Board screened these and invited 15 researchers to submit full proposals of which ten were funded.

One interdisciplinary project, "Development and Verification of a Water Management Model for New Mexico River Basins with Emphasis in Sport Fisheries," is expected to receive a \$236,280 matching grant from the New Mexico Department of Game and Fish. In addition, 11 matching grant proposals totalling almost \$2.5 million were submitted to the U.S. Geological Survey as part of the nationally competitive Section 105 program. The USGS is expected to select those for funding by late summer.

USGS Funded Projects

- *New Gene Sources for Development of Agronomic Plants with Tolerances to Drought and Other Abiotic Stresses.* Glenn Kuehn, chemistry, New Mexico State University.
- *Characterization of Deep Saline Aquifers in the Roswell Basin of New Mexico from Lithologic Analysis and Geophysical Well Logs.* John Mac-Millan and Gerardo Gross, geoscience, New Mexico Institute of Mining and Technology.
- *Trading Conserved Water: A Proposal to Study Market Incentives for*

Agricultural Conservation. Susan Christopher Nunn, economics, University of New Mexico.

- *Studies of Metal Speciation in Natural Waters Based on Modified and Micro Voltammetric Electrodes.* Joseph Wang, chemistry, New Mexico State University.

- *Algal Lipid Production and Value from Algae Grown in Saline Ground Water.* R. Peter Herman, biology, New Mexico State University.

State Funded Projects

- *Heat Shock Protein Expression in Thermotolerant and Thermosensitive Lines of Cotton.* Mary O'Connell, agronomy and horticulture, New Mexico State University.

- *Alluvial Aquifer Heterogeneities in the Rio Grande Valley: Implications for Ground Water Contamination.* Fred Phillips, geoscience, New Mexico Institute of Mining and Technology.

- *Field Analysis of the Role of Three Dimensional Moisture Flow in Ground Water Recharge and Evaporation.* Daniel Stephens, geoscience, New Mexico Institute of Mining and Technology.

- *Hydrocarbons and Liquid Organic Hazardous Wastes in Ground Water.* John L. Wilson, geoscience, New Mexico Institute of Mining and Technology.

Water awards

The American Water Foundation is accepting proposals for its 1988 Research Fellowships. This program is designed to benefit agricultural and water resources interests. American methods, systems and equipment in agricultural production are of interest. Of particular interest is irrigation and drainage, but all aspects of water resources development are addressed. Awards will range from \$200 to \$1,000. Applicants should be students in degree programs such as civil engineering, agricultural, engineering, agriculture, geology, law, economics and political science. The deadline is May 31. For more information contact the WRRRI at (505) 646-1194.



33rd Annual New Mexico
Water Conference
Water Planning from the Town Up
Oct. 27-28, 1988
Hilton Hotel
Santa Fe, New Mexico

USGS upgrades Las Cruces office to subdistrict

The U.S. Geological Survey field office in Las Cruces has been upgraded to a subdistrict office to meet the increased demand for surface and ground water information in southern New Mexico. "The shift of responsibility to the Las Cruces office is the result of litigation and growing interest in fresh water availability and distribution in this region," according to Brennon Orr, supervisory hydrologist.

He said the office now collects and compiles data on ground water in the Mesilla Basin, the Hueco Bolson, the Tularosa Basin, White

Sands Missile Range and Catron County. A recently initiated study will examine ground water flow from the Jornada del Muerto to the Mesilla Basin. In addition, the office will be responsible for surface water data collection in streams originating in the Gila Wilderness and on the Rio Grande.

Orr said staffing will be increased to accommodate these new responsibilities. The Las Cruces office now has three hydrologists and one technician on staff.

The USGS will continue to be housed alongside the WRRRI in

Stucky Hall, which has been home to both since 1971. This cooperative arrangement has worked to the benefit of both organizations. Because people know the WRRRI deals with water, he said they look to the institute for water information. When those questions involve data or other technical matters, the WRRRI staff can field those questions to the USGS. "Our association with the institute also benefits us by keeping us abreast of current research and in contact with academic researchers," Orr said.

WRRRI prepares Town Hall report

The WRRRI has completed a report on New Mexico's water resources as the background document for participants in the New Mexico Town Hall meeting May 16-18 in Angel Fire. New Mexico First, which sponsors the Town Halls, selected the WRRRI, through New Mexico State University, to research and write the report.

The authors of "Water: Lifeblood of New Mexico," were Bobby J. Creel, Linda G. Harris, Gary L. Bruner, Charles T. DuMars, John W. Hernandez and Robert R. Lansford. The 148-page report outlines the major water resources issues in New Mexico and then provides extensive information on each of those issues. It also includes an overview of how New Mexico's cultures have shaped the way the state views its water resources and the influence of culture on water development.

One chapter provides an overview of the water laws that govern New Mexico, while another chapter discusses the state's water management system. The state's

water supply is covered in a basin-by-basin overview. Water demands, projected to the year 2030, are listed for each basin. The implications for these projections are also discussed. The status of New Mexico's water quality is covered along with the regulations governing both surface and ground water quality.

New Mexico First is a non-profit organization created in 1986 at the recommendation of Sen. Pete Domenici (R-NM) and Sen. Jeff Bingaman (D-NM) as a "catalyst" for bringing the people of New Mexico together to consider the fundamental policy issues facing the state. New Mexico First sponsors two Town Hall meetings each year, each focused on a single topic of statewide importance.

Town Hall participants meet on two days in small groups to discuss the selected topic. On the third day they meet in a general session where they establish conclusions and recommendations which will be published as the introduction to the background report.

Membership in New Mexico First

is open to anyone interested in public policy, according to Nancy Magnuson, president of New Mexico First. Town Hall participants are nominated from this membership. After attending the Town Hall, she said participants are encouraged to share the knowledge gained during the meeting and use their leadership to see that the Town Hall's recommendations are acted upon where appropriate.

The first Town Hall meeting was held in October 1987 with "The Marketing of New Mexico" as its theme. Magnuson said the first Town Hall was a "wonderful surprise because it focused positively on what we can do as a state. It accomplished our goal of bringing people together and thinking of New Mexico as the broader state community rather than vested interest groups."

For information about New Mexico First or to order "Water: Lifeblood of New Mexico," write New Mexico First at P.O. Box 25387, Albuquerque, NM 87125, or call (505) 242-3205.

Proceedings and technical reports available

To order the following publications, write the New Mexico Water Resources Research Institute, Box 30001, Dept. 3167, Las Cruces, NM 88003-0001.

#224 — *Development of a Drip Irrigation Scheduling Model* — Sammis, T., S. Williams and D. Jernigan.

#225 — *Irrigation Management Procedures to Maximize Production of*

Alfalfa Populations Selected for Increased Performance Under Deficit Levels of Irrigation — Currier, C., B. Melton, and J. Mayernak.

#226 — *Large Scale Parameter Estimation through the Inverse Procedure and Uncertainty Propagation in the Columbus Basin, New Mexico* — Blandford, T.N. and J.L. Wilson.

#227 — *Hazardous Organic Wastes from Natural Gas Products Process-*

ing and Distribution: Environmental Fates — Eiceman, G.A.

#228 — *Field Study of Ephemeral Stream Infiltration and Recharge* — Stephens, D.B., W. Cox and J. Havlena.

#229 — *Proceedings of the 32nd Annual New Mexico Water Conference: Ground Water Management* — Klett, C.O. (\$5).

Gas wells produce hazardous wastes

A recent study shows that liquid wastes from natural gas production wells contain complex mixtures of hazardous organic compounds that could contaminate New Mexico's surface and ground water supply. "The hazardous wastes are produced in New Mexico and nationally in such magnitude to cause concern at both levels of government," said Gary Eiceman, the New Mexico State University chemistry researcher who conducted the study.

Eiceman tested samples from waste pits in San Juan County and southeastern New Mexico, the

(polycyclic aromatic hydrocarbons), which were found in the wastes, is lethal to insect larvae and fish. "This toxicity may explain extensive fish kills in the Pennsylvania and Ohio oil producing regions during the last 50 years," he said.

Eiceman began the research with no preconceived idea of what he would find. "I didn't have any axes to grind because there had been no previous study to show that the problem existed. He took the study samples mostly from waste pits on Navajo and Jicarilla Apache reservation lands, although later studies

tections in the mid-70s, it exempted oil and gas wastes from regulation because they were not considered a hazard.

In 1961 New Mexico instituted regulations through the Oil Conservation Division (OCD) protecting fresh water from oil and gas brine water contamination. Not until 1985, however, did the OCD restrict direct discharge of oil field produced water in the San Juan Basin. The OCD now prohibits discharges to very shallow ground water and restricts larger discharges to vulnerable ground water.

New Mexico shouldn't have to choose between industry and water quality. We can have both, we simply have to be better environmental managers.

— Gary Eiceman



state's two major oil and gas producing regions. His research, which was supported by the New Mexico Water Resources Research Institute, until recently was the only known documentation to suggest first that the wastes were toxic and second that they could also move through natural gas pipelines.

In New Mexico, oil and gas reservoirs are often found in combination with saline ground water, also called brine water. In those cases, oil, gas and brine water are separated at the wellhead with the brine wastewater disposed of in open air earthen pits or holding reservoirs. The industry has built 61,000 waste pits in New Mexico. Over the years when production was greatest, nearly 6 billion gallons of brine waste were disposed of each year either in these pits or through reinjection.

The problem, Eiceman said, is that these pollutants can end up in either the surface water or ground water. "While the toxic materials make up a minority of the wastes, because they are toxic, they are very important." For example, a group of organic compounds

were made in Louisiana, Texas and West Virginia.

"I found toxic materials at virtually every waste disposal site and in the ground water near the sites. The concentration of contaminants in these samples was 100 times greater than the worst environmental and industrial samples I've examined in 14 years as an environmental chemist," he said.

The wastes can have both immediate and long-term effects on water quality, he said. For example, a waste pit in the city of Flora Vista, was located near the city's municipal supply. The wastes from the pit likely infiltrated the water supply, making it unusable. At other sites, such as those in the San Juan Valley, Eiceman found brine wastes moved quickly through the soils and into shallow ground water.

He said that for years the national strategic importance of the petroleum industry has overshadowed the environmental consequences of poor waste management. He explained that although the Environmental Protection Agency has instituted environmental pro-

Eiceman hopes his findings on the chemical consequences of oil and gas production disposal practices will be useful to those in the oil industry. He also hopes the findings will influence policies on waste disposal, not only in New Mexico, but also nationally. He recently testified about his research at an OCD hearing and has presented his results before the EPA in Washington and Denver. He said his report has been received with surprise, interest and some rancor. "People either love it or hate it, depending on their interest," he said. "We don't want to destroy the industry. New Mexico shouldn't have to choose between industry and water quality. We can have both, we simply have to be better environmental managers," he said.

Eiceman's report, "Hazardous Organic Wastes from Natural Gas Products Processing and Distribution: Environmental Fates," Report No. 227, is available from the New Mexico Water Resources Research Institute, Box 30001, Dept. 3167, Las Cruces, NM 88003-0001.

El Paso appeals New Mexico decision

After presiding over 58 days of hearing and reading 13,000 pages of testimony, on Dec. 23, 1987, New Mexico State Engineer Steve Reynolds denied El Paso's well applications in a mere eight pages. He concluded that El Paso had a sufficient water supply to meet its needs to the year 2020, 40 years from the date of its application. In invoking the 40-year rule, he treated El Paso as the law required him to treat any municipality, inside or outside New Mexico. El Paso has consistently opposed the 40-year planning limit as too restrictive.

His evaluation of El Paso's supply and demand was far different from El Paso's view. For example, in his ruling Reynolds cited State of New Mexico estimates that El Paso's population would reach 874,000 by 2020, while El Paso estimated its population to be over 1 million by then. Using the 874,000 population base, he found that El Paso's supply of 167,000 acre-feet a year would meet the estimated demand of 163,000 acre-feet a year.

In addition to using water from the Hueco Bolson and the Canutillo well field, Reynolds was convinced that El Paso could meet its needs through its power to condemn property for water system purposes, and through the use of Rio Grande Project surface water. He said such supply avenues should be the first priority in El Paso's water development plans.

At the same time Reynolds denied El Paso's Hueco Basin well applications, he also denied their applications in the Lower Rio Grande Basin. According to a prehearing order, the two sets of applications were addressed as "common issues."

What Reynolds' decision did not contain was a single mention of New Mexico's ground water export law. This statute, as opposed to the 40-year rule, addresses export outside the state. By declining to address the export statute, Reynolds avoided any association with the constitutional issue of interstate commerce.

In January El Paso's Public Service Board declared that not only would it appeal the denial, it would also try to stop anyone else from pumping water from the Hueco and Lower Rio Grande basins. In addition, it would take court action to protect its Canutillo well field and its Rio Grande Project surface rights from any pumping that might result from a lawsuit filed by the Elephant Butte Irrigation District. The district is trying to force Reynolds to inventory all water rights from Elephant Butte Dam to the Texas state line, a process that could take 10 - 15 years during which time permits for new uses would not be issued.

By the middle of January, El Paso had filed appeals in both the U.S. District Court and the New Mexico District Court. By filing in both

courts, the city ensured that its appeal would be heard.

El Paso's appeal to the federal court, which is where it expects the battle to be won or lost, accused New Mexico of "willful disregard of the U.S. Constitution prohibition against economic protectionism." El Paso contended that although New Mexico's new export law is not unconstitutional under federal law, the way Reynolds applied the new law is unconstitutional because it discriminates against El Paso. El Paso said this discrimination will cost at least \$1 billion, the difference between the cost of New Mexico ground water and the next cheapest supply.

El Paso charges that the 40-year rule was a "deliberate effort to bolster the longstanding New Mexico Water Embargo . . ." The 40-year rule states that municipalities must put their water to beneficial use within 40 years of permit approval. Because New Mexico enacted the 40-year rule after El Paso filed its applications in 1980, El Paso says the law was used as just another way to deny El Paso the permits.

Because the federal court reviews only evidence presented at the hearing, its ruling is expected to come ahead of the district court's ruling. If El Paso wins in federal court, it is expected to drop the state court proceedings.

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