

NEW MEXICO WATER RESOURCES RESEARCH INSTITUTE  
RESEARCH AND INFORMATION RESOURCES

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You spent yesterday hearing everything you always wanted to know about the New Mexico Environmental Improvement Division (EID) and the U.S. Geological Survey (USGS). Today, it's my turn to tell you about New Mexico's Water Resources Research Institute (WRRI).

First, I'm going to tell you what the institute is not. It is not a water testing laboratory. It is not the sponsor of water utilities management courses and it is not the place to complain about your water utilities bill. We are not a branch of the Interstate Stream Commission, an offshoot of the New Mexico Department of Agriculture nor even "those folks involved in the El Paso water suit." What we are is the New Mexico Water Resources Research Institute and as our name implies, we sponsor water research in New Mexico.

The institute was established in 1963, the first such organization in the United States. Originally, the institute coordinated water research only at New Mexico State University. In the two decades since, the institute has taken on a statewide role in encouraging water resources research--even with the dreaded University of New Mexico Lobos. We now work with all the state universities, state agencies and federal agencies that sponsor water research activities.

Last year, the institute administered 39 projects ranging from basic laboratory research--such as a genetic engineering study of chile--to

field research, computer modeling and economic impact studies. The institute also provides a training ground for young scientists. In the past 10 years alone, an average of 90 students a year have worked on WRRRI-sponsored research projects.

Although the scope of the institute's research has grown, we have retained our original administrative and informational responsibilities.

Unlike the institutes in many other states, we have no in-house research staff. Instead, the WRRRI helps researchers statewide obtain project funding. We also assist granting agencies in determining where to invest research money.

Until 1982, federal funds made up the bulk of the institute's budget. But with federal reorganization now underway, the balance is tilting more toward state and private funding. We have been able to weather this federal drought in part because of the flexibility built into our research program and especially because of the expertise of our researchers. However, funding uncertainty has made us a very aggressive lot in searching out new funding sources. This year, for example, we were active in urging the State Legislature to pass a bill naming the institute as administrator of a \$500,000 saline water research project in Roswell. The institute will cooperate with other agencies and the city of Roswell on this multidisciplinary two-year project.

The WRRRI is not one of the big spenders for research. We rarely allot more than \$25,000 for one project. This money often matches or supplements funding from other sources. We encourage researchers to use this as "seed money" to attract other project sponsors. One saltgrass

project, for example, started as a small, one-year project but eventually evolved into a long-term multidisciplinary effort.

Most projects selected for funding through the institute have addressed one of five basic issues in water resources. Those issues are: the relationship between surface and ground water, urban and industrial development, water quality, conservation and water rights.

Because we are here today to talk about water quality, I will focus on research that specifically addresses that issue. In the past, the dominant water issue has been one of quantity--conserving the scarce supply. Knowledgeable people, however, realize that protecting the quality of our available water is just as important as conserving water quantity.

New Mexico has to be protective of its water supply because the state only receives about 13 inches of precipitation a year. This precipitation, plus river flows into the state, add 87.7 million acre-feet of water each year to the state's total. Ninety-seven percent of this evaporates. River flows to Texas and other losses take back most of the rest, leaving a net of 1.2 million acre-feet of usable surface water. This water is essentially all appropriated for beneficial uses.

New Mexico has vast underground water supplies--estimated at 20 billion acre-feet--but because most of it is saline or brackish, it is less desirable for public use. Fresh water aquifers are already used extensively and must be protected from degradation.

When most people think of poor water quality, they think of industrial pollution. But in New Mexico, poor water quality is often associated with high salt content. Decreased water quality as a result of increased

salinity is a major concern of irrigated agriculture--the state's biggest water user. Most of the water applied to a crop is evaporated or transpired, leaving the salts to accumulate in the soil. Successful, long-term irrigated agriculture necessitates that these salts be periodically leached from the soil.

These leaching waters have elevated salt loads and eventually find their way back to the river through drains as irrigation return flow. An inescapable consequence of irrigated agriculture, then, is the degradation of the water supply where irrigation return flow constitutes a significant percentage of the volume of a stream.

The Rio Grande is a classic example of a stream that suffers water quality degradation as a result of irrigated agriculture. As it flows southward through the state, the flow decreases--water is used in irrigated agriculture--and the salt content increases.

Between Otowi Bridge and Fort Quitman, Texas, the flow registers a five-fold decrease, while the total salt load increases eight times. Larger, less agriculturally developed rivers do not show this striking relationship as markedly, but all rivers used for irrigation are subject to some degree of degradation.

The institute has sponsored several projects that centered on controlling such water quality degradation. One project involved a 450-acre demonstration farm in the Mesilla Valley. Results from the study showed how improved irrigation techniques could minimize unnecessary leaching losses and the concomitant stream degradation. These techniques include irrigation scheduling, laser leveling of fields and even trickle irrigation of high value crops such as chile.

Nonagricultural demands on New Mexico's available water supply make up about 10 percent of the total. Although industrial and domestic demands are relatively small, these are the areas where demand is increasing rapidly.

One way to stretch the supply to meet these demands is to judiciously maintain the quality of the available supply. To do that, research has tackled several projects aimed at preserving and conserving New Mexico's water.

One of our current projects is examining the effects of common disinfectants on wastewater. The project researcher is looking at two disinfecting agents--chlorine dioxide and ozone--which are widely used in Europe, but not in the United States because of they are too expensive. The major advantage of these disinfectants over chlorine is that they do not react with organic molecules in the water to produce chlorinated organic compounds. Many chlorinated organics are toxic or carcinogenic.

Another WRRRI-sponsored project involved desalting water for public supply. As it stands, many New Mexico communities use water which does not meet the National Drinking Water Standards. The substandard conditions may be caused by the total salinity of the water supply or high levels of specific elements such as uranium or fluoride.

Researchers built the mobile desalting van to demonstrate on-site reverse osmosis and electrodialysis techniques in desalting water. Because the van was taken into the communities, the residents could see if the techniques worked in solving their particular water problem. The communities also were given an idea of how much the desalting would cost.

As you heard in the EID session, New Mexico's water has not escaped the water pollution problems that have plagued many of the industrial states. The WRRRI has also tackled that type of water quality problem. For example, one researcher is developing a highly sensitive detector for heavy metals in water. The goal is the instant on-site detection and recording of the levels of certain toxic elements in rivers or industrial waste streams. Previously, samples had to be taken to the laboratory for tedious analysis. This new system allows a plant operator to correct a process or treatment problem before environmental damage takes place.

These projects plus those of the next speakers are a few examples of how water resources research is attempting to solve New Mexico's water quality problems.

The institute is not all research proposals and demonstration plots. There is another facet to our institutional identity--water resources information. The New Mexico Water Conference is our most public outlet for water resources information. Each year for the last 28, the institute, on the recommendation of its advisory committee, chooses a specific New Mexico water problem as the conference theme.

The insitute also publishes the research results of every project it administers. These publications are a valuable source of information for other researchers and water resources agencies.

The Divining Rod, our quarterly newsletter, keeps more than 2,000 persons updated on water resources issues, water research and new publications. If you would like to be added to our mailing list, call the institute.

Researchers, students and the general public have access to the some 4,000 volumes in the institute's water resources library. Scientists often will use the library for literature review before submitting a research proposal and again for reference while working on the project.

In a nutshell, this is what the New Mexico Water Resources Research Institute does. But if you still want to know where to get your water tested, or where to pay your utility bill, give us a call--we also make referrals.