

MEGATRENDS

Conference: What's big, what's ahead

The new West has a starring role in the megatrend world of future forecasting. Why not? It's warm here, we have a certain energy in our ideas, plenty of

Trends, like horses, are easier to ride in the direction they are already going. John Naisbitt, "Megatrends"

Court decisions are changing the character of western water law and how those changes eventually will affect eastern states.

In the segment on environmental considerations you will hear how legislation such as the Wild and Scenic Rivers Act and the Endangered Species Act influence

litigation process, and the value of negotiation versus litigation. This segment promises to be a

We would have been labeled dreamers of the wildest variety a half or even a quarter century ago for some of the measures which are being taken today to develop a water supply. Elmer G. Bennett, Undersecretary of the Department of the Interior, Third Annual New Mexico Water Conference, 1958

divining rod



Vol. VIII No. 3

New Mexico Water Resources Research Institute

August 1985

land, low taxes. And a beady eye on our water.

Our times call for more liberal support of basic research than it is now being given anywhere in the free world. Clinton P. Anderson, U.S. Senator (NM) Seventh Annual New Mexico Water Conference, 1962

At the 30th Annual New Mexico Water Conference you will learn the part "Megatrends in Water Resources" will play in that megatrend future. The conference will be held Oct. 24-25 at New Mexico State University's Corbett Center, Las Cruces.

The conference will cover six "megatrends": water development, water law, environmental issues, interstate compacts, water research, and Indian water resources.

From water development experts you will learn how the decline of big water projects has resulted in a trend toward using existing projects to extend available water supplies. You will also hear about the trend toward state and local project financing.

In the water law segment, you will hear how recent Supreme

water resources decisions. In addition, you will hear how the state and federal government proposes to handle the growing problem of ground water contamination.

Interstate compacts already have proved their worth in avoiding costly litigations among states. You will hear discussions of why that trend has become more pronounced in the West and how compacts could be used in eastern states as well. You will also be introduced to the realities of ground water compacts.

The gee-whiz futurists are always wrong because they believe technological innovation travels in a straight line. It doesn't. It weaves and bobs and lurches and sputters. John Naisbitt, "Megatrends"

What's hot in research, what's not, and how can you tell? This segment on research success will tell you how you can make breakthroughs happen and how you can ride the research trend in the direction it's already going.

You will also hear experts present their respective views on megatrends in Indian water resources. They will discuss the

dispassionate discussion of the scope of Indian water issues.

The conference fee of \$25 covers registration, lunch and the proceedings. The student rate is \$10. The Oct. 24 banquet will cost \$13 per person. For more information call (505) 646-4337.

Banquet offers fun, good food

Pat O'Meara, the wit of the National Water Resources Association, will be the guest speaker at the 30th Annual New Mexico Water Conference banquet.

O'Meara has just retired after 28 years in Washington, D.C., where he helped develop the nation's saline water conservation program, was director of the Office of Saline Water, and editor of the straight-talking NWRA newsletter "National Water Line."

The banquet, which is open to conference participants and guests, will be held Oct. 24 at the Las Cruces Holiday Inn. Banquet tickets are \$13 each and are not included in the registration fee.

Abundance fills dams, erases debts

In the end, New Mexico Rio Grande Compact Commissioner Steve Reynolds called the water surplus a blessing, but for a while the good news was nearly drowned out by a chorus of complaints. It seems that in this part of the country people know how to deal with water shortage better than they do water surplus.

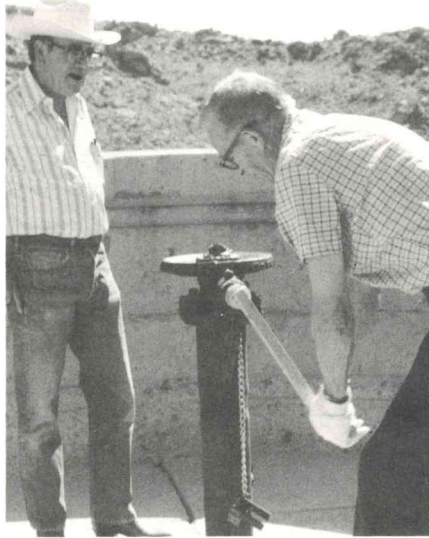
White water rafters complained that high water forced them to cancel the 28th Rio Grande White Water Race. Archaeologists protested that water backed up behind Abiquiu Reservoir could destroy Indian ruins in the Bandelier National Monument, while environmentalists warned that flood water could wipe out the winter habitat of 35 bald eagles at Cochiti Reservoir.

Albuquerque, which had carefully marshalled water rights to supply future growth, didn't know what to do with its surplus. Although farmers generally were happy about the surplus, some preached the never-give-an-inch theory when it came to delivering surplus water downstream.

The unusual abundance of water can be traced to heavy snows in the past three winters. Snowmelt, which accounts for most of the state's surface water supply, filled Cochiti and Abiquiu reservoirs to record levels. The two reservoirs were designed originally to be used primarily for flood control. This summer the two dams played that role by acting as a back up to the bulging Elephant Butte Reservoir, which reached 95 percent of its capacity in June.

By storing the extra floodwater upstream, the Rio Grande Compact Commission had prevented an actual spill at Elephant Butte. The dam had spilled over for five weeks in 1942, the only actual spill since the dam's construction in 1916.

On June 13, however, the spill was on paper. The "paper" spill not only prevented overflow water from flooding Truth or Consequences downstream, but it also wiped out the water debt Colorado and New Mexico owed Texas.



Phil Mutz (left), New Mexico Interstate Stream Commission engineer, offers encouragement to Steve Reynolds, New Mexico Rio Grande Compact commissioner, as Reynolds cranks open one of four spillway gates at Elephant Butte Dam. The Rio Grande Compact commissioners from Colorado and Texas also took part in the ceremonial spill.

According to the Rio Grande Compact, which since 1939 has regulated the use of water in the Rio Grande in Colorado, New Mexico and Texas, each of the three states is allowed an equitable share of the water. In 1954, however, drought caused Colorado and New Mexico to fall short of their water commitment to Texas. In the 30 years since, the two upstream states eventually ran up a debt totaling 718,000 acre-feet, the amount equal to one-third the capacity of Elephant Butte Reservoir.

The compact states that in the event of an actual spill, the water debt would be paid in full. Although the spill was not physically allowed to occur, the

"paper spill" technically fulfilled the compact requirement. The water that would have physically spilled was actually retained in New Mexico's northern reservoirs including Abiquiu and Cochiti.

Although the Elephant Butte Reservoir is located 100 miles from the Texas border, New Mexico is obliged under the compact to meet the water delivery schedules set for the Elephant Butte Irrigation District in New Mexico and the El Paso County Water Improvement District Number 1 in Texas. In addition, under international treaty the U.S. government requires that Mexico's share of the Rio Grande also must be met.

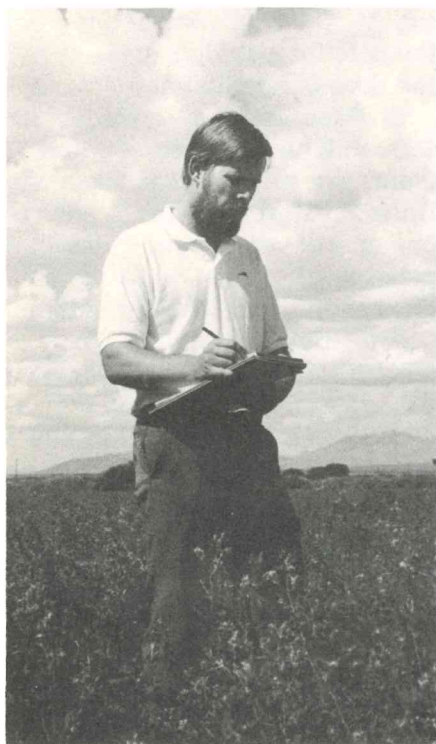
Rio Grande Compact commissioners Jeris Danielson, representing Colorado, Steve Reynolds, from New Mexico and Jesse Gilmer from Texas celebrated the paper spill July 3 in ceremonies at Elephant Butte Dam. The commissioners were joined by federal commissioner Arlene Ham, U.S. Bureau of Reclamation officials and irrigation district representatives from the three states.

The ceremonies began with commemorative photographs, "I survived the spill" teeshirts, and good natured speeches. The four commissioners then opened the spillway gates sending water gushing down the spillway for about two hours.

At a commission meeting the day before, the commissioners voted to ask New Mexico and Texas attorneys general to drop a 1968 U.S. Supreme Court lawsuit against Colorado for running up a water debt.

According to Steve Reynolds, restriction on ground water pumping in the Middle Rio Grande Valley should prevent New Mexico from getting into major debt again.

Tests uncover alfalfa elite



Cliff Currier records the growth rate of drought-tolerant alfalfa being field tested.

Cliff Currier loves alfalfa. He doesn't eat the stuff, but he does grow it in his front yard. And in the summer, only the bees take more interest in the purple flowered plants.

The New Mexico State University plant breeder admits that although alfalfa's "wild genetics" have confounded researchers since NMSU's alfalfa breeding program began in 1947, the perennial plant is worth every bit of the trouble.

Alfalfa grows on a fourth of New Mexico's irrigated acreage and is the number one cash crop in the state. Currier and long-time NMSU plant breeder Bill Melton are looking at plants that can produce higher yields with less water.

"But we don't want just survivors," Currier says, "we want survivors that grow." To find what Currier calls the "elite" plants, the researchers begin with 1,000 alfalfa plants. After six years of testing, the field is narrowed to 10

"elite" plants.

He calls them "mother" plants because they bear the seed, and they are the only known parent. "We don't know the father's side because we don't know where the bees have gotten the pollen," he says. Currier then gauges the quality of the mother plant by testing its offspring. "It's like looking at a family with three or four children to size up what kind of parents they have." The difficulty, Currier says, is that you can't judge alfalfa by looking at just one or two offspring. "With corn hybrids or wheat, you can evaluate the potential of the line on the basis of one seed. It takes at least 60 seeds for alfalfa," he says.

Despite the genetic stumbling blocks, the researchers have found a population, labeled 9-D-11A, that survives—and thrives—under limited irrigation. In field tests, the population produced 75 percent more than the check variety under low irrigation. Under moderate irrigation, 9-D-11A produced equal to the check, and under optimum irrigation, it produced 22 percent more than the check.

The beauty of 9-D-11A is that it seems to produce well under both high and low irrigation conditions. Currier says because a well managed field can last four to six years without replanting, it would be more economical to have a variety that produces the maximum yield regardless of the water available.

To be released as a variety, however, the population must prove itself over a three-year period of field and seed production tests. Currier says every two or three generations of seed will be tested to verify the performance found in the first generation.

Currier believes that a high-producing, drought tolerant variety would especially benefit farmers in the Pecos Valley. Farmers there suffer under the double burden of water limited to 42 acre-inches a year and high pumping

costs. In addition, he thinks alfalfa has potential as a dryland crop and even for rangeland improvement. "It's my dream," he says, "to develop alfalfas that survive and grow under all New Mexico's harsh conditions."

In the meantime, he will continue playing alfalfa's genetic crossword game, practicing the "art" of plant breeding and keeping ahead of the bees.

WRRRI series includes reports, video

Publications

#163-Adaptation of *Crambe Species as an Alternate Biological Source of Oil and Protein for Arid Lands Agriculture*-Chan, J.L.; Fowler, J.L. and Roberts, C.L.-June 1985

#173-Environmental Modeling of Toxic Volatile Organic Compounds in Rivers-Eiceman, G.A. and Cadena, F.-July 1983

#185-Role of Nitrogen, Phosphorus and Iron in Occurrence of Algal Blooms at Abiquiu and Cochiti Reservoirs-Johnson, G.V. and Barton, L.L.-April 1985

#186-Projections of Water Availability in the AWR and Pecos River Basins to the Year 2005-Tysseling, J.C. and McDonald, B.-April 1985

#187-Evaluation of the Potential for the Genetic Improvement of Salt Tolerance in Chile Pepper (*Capiscum Annuum*) Using Wild Germplasm and Cell Selection Procedures-Tanksley, S.D. and Phillips, G.C.-March 1985

#188-Adaptation and Application of a Surface Erosion Model for New Mexico Forest Roadways-Ward, T.J. and Seiger, A.D.-July 1983

#189-Removal of Hydrogen Sulfide in Drinking Waters with Hydrogen Peroxide-Cadena, F.-February 1985

Videos (Available on 10-day loan)

V5-Common Needs, Common Waters (The development of water rights in New Mexico) 14 min.-August 1985



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a highly scientific person.”

The selection of the institute site was important because the institute program brought with it the power to allocate \$75,000 annually in federal dollars. Although the University of New Mexico (UNM) and New Mexico Institute of Mining and Technology bid for the institute, once the decision was made, both universities fully backed the decision.

Dr. Thomas G. Bahr, the institute's current director, credits Stucky's fairness with the institute's success. In 1984, the federal government contributed \$109,000 to each state program. The state's contribution to the institute's research budget has grown from \$104,000 in 1971 to \$414,500 in 1985.

Research is statewide

Stucky also saw to it that the research program's design was fair to all universities. From the beginning, the institute has operated without an in-house research staff. Instead, researchers in all disciplines from any of the state's universities can compete for research grants.

“If the institute had its own staff, for example,” Stucky says, “we would have wound up with a lawyer, an agronomist, an economist and an irrigation specialist. And when we were finished with economic studies, we would have been stuck with the economist.”

Dr. William A. Dick-Peddie was a member of the Research Advisory Board that in 1965 helped establish the direction the research work would take. “Ralph set up the research program exactly as it was intended in the original federal legislation,” he says. Dick-Peddie says some institutes restructured their programs to include in-house researchers, a system eventually adopted by a majority of the 54 institutes.

Dick-Peddie, an NMSU biology professor, says because all the state's universities are eligible to compete for water research grants, the institute has been able to become “truly a statewide institute.” He says he has never heard criticism around the state about the fairness of the research awards.

Dr. Nathaniel Wollman agrees. Wollman, a UNM professor emeritus in economics, was a member of the first Program Development and Review Board, which is responsible for selecting projects for funding. The board, which was established in 1967, is made up of representatives from NMSU, UNM and the New Mexico Institute of Mining and Technology.

Competition brings vitality

“Those of us who were not from NMSU never had a sense of injustice in the selection of the projects,” he says. “Ralph was a very good administrator, very fair. All of us enjoyed the role we had to play—the intellectual contact—and tried to do an objective job of evaluating research proposals,” he says.

He says the competitive grant process “added to the vitality of the research program,” with different researchers contributing their knowledge to solving water resources problems. “If the institute had taken a different approach,” he says, “that effect never would have been achieved.”

Since the first research project was completed in 1966, nearly 200 projects have been administered through the institute.

With the research program well underway, Stucky decided the institute needed to get “landed somewhere.” Although Stucky treats the push for a building matter-of-factly, Corbett, NMSU's president from 1955 to 1970, viewed the building as political insurance.

In a March 1978 taped interview, Corbett said “I felt that if we could have a building called Water Resources Institute that would decide the political

(issue).” The building, Corbett said, “got the other institutions to recognize that this was the headquarters for water resources research.”

Stucky Hall, built with \$150,000 from the state legislature, opened for business on the NMSU campus in March 1970. Until he retired a little more than a year later, Stucky enjoyed the distinction of having his office in a building that also carried his name.

Looking back 30 years to the institute's beginnings, Stucky says he is thankful the research program, now totaling more than \$1 million a year, is vigorous and strong.

Layman needs to know

But Stucky still is not happy about one thing. “Results of water research are not getting out to the people as adequately or quickly as needed.” He suggests that the best way to get the word out is to analyze and report research results in a format the layman can understand.

When he retired in 1971, Stucky did not relinquish his title as trend-spotter. He and several NMSU colleagues spearheaded a drive to build a retirement community in Las Cruces.

“We called a meeting and sent letters to people we thought were interested. We expected just a few people to come, but 40 people showed up.” Sound familiar?

The retirement complex, which is named Good Samaritan Retirement Village, **not** Stucky Village, is now worth nearly \$10 million.

Lab tests water

The folks at the Roswell Test Facility reminded us that NMSU's Soil, Plant and Water Testing Laboratory isn't the only water testing lab in southern New Mexico. Roswell also is open to the public and state certified to test water for public drinking water standards. The facility also runs analytic tests for desalinization of brackish water.

Back to the beginning

He never would have made the pages of *In Search of Excellence*, he doesn't have that kind of charisma. And his company never would have made *The 100 Best Companies to Work for in America*, he worked for the state. But he does prove the entrepreneur's adage that success comes to those who can spot a trend *before* it becomes one. Ralph Stucky spotted his megatrend 30 years ago.

In 1954, the former Extension Economist from Bozeman, Mont., arrived at New Mexico State University (NMSU) to head the Agricultural Economics Department with the charge to develop courses in agricultural economics. Water resource economics was one of those courses.

As a way to involve students in critical water issues, Stucky scheduled seminars featuring water resources experts. The caliber of the seminars soon attracted the attention of those outside the classroom.

To meet the evident demand for a water issues forum, Stucky scheduled the same speakers for a conference in the fall of 1956. He expected to draw a few dozen participants. Instead, 150 people showed up and when the conference ended, they voted to make it an annual event.

Common problems

"At the first one or two conferences," Stucky says, "there was the feeling that people from the Upper Rio Grande region wouldn't have anything in common with those from the southern part of the state." As they talked, he says they began to understand that New Mexico's water problems affect everybody, not just one group or one region.

Sen. Clinton P. Anderson (D-NM), who was later to play a pivotal role in establishing the national water resources research institute program, spoke at the third conference in 1958. He told the audience that talking about



Ralph Stucky helped design Stucky Hall, home of the New Mexico Water Resources Institute.

his congressional involvement in water resources "was almost like suggesting that I sit down and tell my life story."

Stucky's life story also has been tied to water. He grew up on an irrigated farm in Montana's Gallatin Valley where rainfall averages only about 15 inches a year, New Mexico's annual average.

"A lot more people are interested in what the farmer does than the farmer," he says citing the recent controversies between bankers who overextended loans and farmers who bought land at inflated prices. "It's just as important to know how to handle money as it is to know how to breed cattle," he says.

Stucky knows how to do both. He holds a bachelor's degree in animal science from the University of Idaho, and a master's and doctorate in agricultural economics from the University of Minnesota.

At the time Stucky was attracting a statewide audience to his water conferences, national concern over water resources also had come into focus. In 1960, the U.S. Senate Select Committee on



National Water Resources began a study on the growing problems of water shortages and pollution. Anderson, who had also served as the Secretary of Agriculture, was a member of that committee.

That committee's final result was the Water Resources Research Act of 1964, which established water resources research institutes in each state and Puerto Rico.

During that period, Stucky and NMSU President Roger Corbett were working toward establishing a water research institute at NMSU. They beat Washington by a year and a half.

In February 1963, NMSU's Board of Regents established the New Mexico Water Resources Research Institute as a separate organization within the university. Its goals were to bring together "research and teaching programs related to water." Stucky was named institute chairman.

Stucky's diligence paid off when New Mexico was the first state brought on line under the federal institute program. Each state's governor was given the authority to select the university to house the institute. That prize went to NMSU.

Governor selects NMSU site

Jack Campbell, New Mexico's governor in 1964, credits Stucky's vision and organizational skills with the inception of the institute program. "It was clear to Dr. Stucky that water resources were top priority in New Mexico's future and needed to be institutionalized," Campbell says.

In addition, he says Stucky had the "tenacity and awareness of the political process to get it done—not common attributes of

Continued on Page 4

Court okays NM 40-year regulation



White water gushes down the spillway at Elephant Butte Dam. The spill wiped out the water debt Colorado and New Mexico owed Texas. The only other spill occurred in 1942.

New Mexico has weathered another challenge to its water law in its latest round in court. On May 24 state district court judge Art Encinias validated New Mexico's regulation limiting municipalities and utilities to a 40-year planning period for the use of water rights.

In its appeal to that ruling, El Paso is arguing that the regulation is illegal and will "unlawfully abridge El Paso's right to appropriate public waters of New

Mexico in accordance with its needs." El Paso's lawyers contend the regulation is unconstitutional because it limits only cities and counties to the 40-year water planning and development period.

El Paso based its original 1980 application for 326 wells in New Mexico on a 100-year planning period. Because the 40-year planning period begins with the date of application for water, El Paso has used up five years on its ap-

plications. El Paso is also disputing the start-up date saying the 40 years should begin from the date the permit is granted, not the date of application.

El Paso recently unveiled its \$33 million sewage treatment plant, the first of its kind in the United States. The plant is capable of reclaiming 10 million gallons of waste water a day, enough to serve 50,000 residents.

After purification, the water is injected into the aquifer where it will travel through 2,600 feet of natural sands for about two years before it is removed and used for drinking water.

In other action, the New Mexico Land Office has filed 356 applications for water rights on state and federal land in Dona Ana County, the same general area as El Paso's applications. The applications are the first in what may be a series of planned water rights applications on state lands that might be considered in trade for other public lands.

The applications, filed July 19, put the New Mexico Land Office in line behind other applicants, including El Paso, the city of Las Cruces, private individuals and Fort Bliss.

Thomas G. Bahr, director, New Mexico Water Resources Research Institute
Linda G. Harris, editor

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