



# DIVINING ROD

NEW MEXICO WATER RESOURCES RESEARCH INSTITUTE

• 20TH ANNIVERSARY •

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## Divining Rod turns 20

Two decades ago, in the spring of 1977, the *Divining Rod*, the New Mexico Water Resources Research Institute's quarterly newsletter, debuted. Its first editor, Douglas Clark, went on to write several popular biology laboratory skills correspondence courses for the WRRRI, still requested today.

The premiere issue announced the upcoming 22nd Annual Water Conference—Water in the Future: 208 and You. At the time, New Mexico was grappling with designing management programs to control nonpoint sources of pollution as specified by Section 208 of the Federal Water Pollution Control Act Amendments of 1972.

Twenty years later, plans are underway for our 42nd Annual Water Conference scheduled for October 2-3, 1997 in Tucumcari.

Back in '77, Dr. Garrey Carruthers, then an associate professor of agricultural economics at NMSU, was acting director of the WRRRI. And as most of us know, Garrey later became the 27th governor of New Mexico. Gail Stockton, now with the Army Corps of Engineers, was assistant to the director, and Darlene Reeves, still with the WRRRI after all these years, had just completed her bachelor's degree.

Two issues later, in the fall of 1977, the institute's new director was announced. Tom Bahr would be relocating to New Mexico from heading the water institute at Michigan State University for four years. Garrey Carruthers was bid a fond farewell as he resumed full-

time professorial responsibilities at NMSU.

And what was happening in water research back in the late '70s? *Forecasting Future Market Values of Water Rights in New Mexico* by F. Lee Brown, Charles DuMars, and Rahman Khoshkakhlagh had just been published by the institute. The University of New Mexico researchers had sent questionnaires to buyers and sellers of water rights, from 1962 to 1977, in the major river basins of New Mexico.

researchers were on target. F. Lee Brown recently remarked on the study's projections, "I'm pleasantly surprised the projections turned out to be in the ballpark."

Also back in 1977, New Mexico Tech researchers, Drs. Donald Brandvold and James Brierley, were busy monitoring water in the Luis Lopez drain east of Socorro. Their two-year project indicated that the effects of water pollution from sewer and feedlot effluent were not severe. However, they did find cause for concern in the local practice of

pumping the overflow from flooded cesspools and septic tanks into irrigation ditches or fields.

Ten years later, not surprisingly, nearly every issue of the *Divining Rod* for a couple of years devoted space to the El Paso lawsuit. But despite the attention the El Paso case generated, research continued to be the focus of institute efforts and newsletter coverage.

From studies of the nutritional value of Russian thistle; to years of testing trickle irrigation on high value crops; to examining the ancient shorelines of California's Lake Mohave for clues to the creation, disappearance and rebirth of desert lakes;

to a 15-year sport fishing management project—the WRRRI newsletter has kept its readers apprised of the latest research efforts funded through the institute.

And after 15 years of the same design for the *Divining Rod*, we thought we'd sport a new look. Here's to the next 20 years!



The projected prices of water rights per acre-foot in the Rio Grande Basin (excluding the Santa Fe market) were, in 1967 dollars, \$563 in 1980, \$728 in 1985, and \$1192 in 1990.

How accurate were these projections? Correcting for inflation, and given that the City of Albuquerque currently is paying about \$2,500 per consumptive acre-foot, the UNM



## Basabilvazo gains recognition

by Teresa Lambright  
Carlsbad Current-Argus  
February 28, 1997

*Although the following article is not related to water, we consider the protagonist in the story a "water friend." Prior to working for DOE, Basabilvazo worked for the USGS in the Las Cruces subdistrict office, housed at the time in Stucky Hall, home of the WRRRI. The WRRRI staff congratulates George on his find.*

For more than a year, he has remained in the shadows—the unsung explorer watching events unfold around his lifetime discovery. But the museum display of rarer than rare fossilized dinosaur skin artifacts has finally brought Carlsbad's George Basabilvazo into his share of the spotlight. "Finally," Basabilvazo said Thursday at a surprise party held for him in his Department of Energy office. "It's nice to see it all come to fruition."

Last month, paleontologists for the New Mexico Museum of Natural History and Science in Albuquerque, under the direction of Spencer Lucas, began excavating an area near Deming for the heralded 70 million year old skin. The team, according to media accounts, was led to the site by a 10-foot rock specimen found six years ago by a graduate student studying rocks in the area. Basabilvazo was that unnamed student—the same student who refused to believe Lucas when he explained the unusual rock as fossilized tree bark. Likewise, Basabilvazo said, he didn't believe the second opinion either—shark skin. Instead, he spent the next three years trying to justify his instincts about the pock-marked rock. Five years later, the announcement was made, with only the sketchy tie to Basabilvazo as finder of the ex-

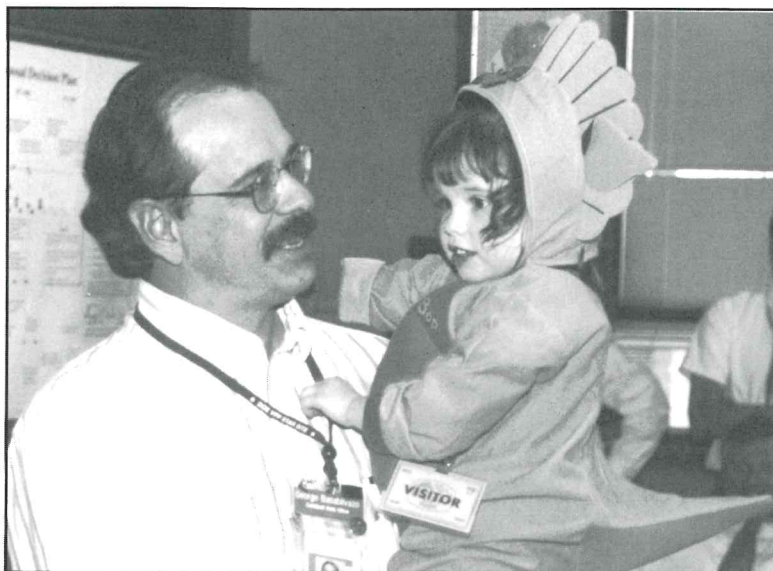


Photo by Alfred J. Hernandez, Carlsbad Current-Argus.

*George Basabilvazo, an employee of the Department of Energy, was congratulated by his daughter, Bianca, at the DOE area office in Carlsbad. Basabilvazo has been acknowledged as the first man to discover fossilized dinosaur skin.*

tremely rare artifact. It was more than a year later that the connection was made, according to Basabilvazo.

On February 20, as an exhibit of the skin fossil was unveiled at the Albuquerque museum, Lucas introduced Basabilvazo as the fossil finder before a crowd of 300-400 people. There with wife, Yvonne, and 2-year-old daughter, Bianca, Basabilvazo spoke for the first time about his discovery. The next day, as the display was put in place, he happened upon an Albuquerque television station taping a broadcast and was thrust again into the limelight. And add to that, Basabilvazo said, the congratulations of fellow DOE workers, who "really are a family that support not just me, but other folks who accomplish things."

"It's not often you meet somebody who's the first to do something in a long, long time," DOE Director George Dials said at Thursday's party. "He's probably not the first guy to get that close to dinosaur skin, but that other guy got eaten." A modest Basabilvazo only smiled. He said it is recognition he relishes almost as much as knowing his find really was the find of a lifetime. To discover such well-

preserved skin fossils is called "amazing" by experts, who add the discovery of 16 vertebrae in the area only accentuate the value of the find.

For now, Basabilvazo is working on an article on the Deming area's geology for publication this year and plans to co-author a follow-up article on the skin find with Lucas in addition to writing an abstract for the Bureau of Mines on the find.

"It's very rare, almost as rare as skin," Basabilvazo said. "This discovery only provides more information that furthers the science." And, he added, it's all very exciting. "This has been my dream to be a geologist. I've sort of gotten away from being a geologist, but it's nice—this is sort of a lasting reminder of what my dream was." Plus, he said, when he meets his goal of seeking a Ph.D., the find will be a real stepping stone in terms of credibility and references. "Folks could use something like this as a career alone," he said. "Someone could ride it for many years."

There's one more prize at the end of this rainbow. "If they (the excavation team) go back again, I'm sure they'd invite me now," he laughed.



## NEWS BRIEFS

### Water Rights Adjudications Along the Rio Grande

*Western States Water* included an item in its January 1997 newsletter on New Mexico State University and the New Mexico State Engineer Office's proposal to use alternative dispute resolution (ADR) methods to expedite and improve Lower Rio Grande adjudication proceedings. NMSU's framework document notes that "the challenge in an adjudication where literally thousands of parties are involved, each with separate property interests, is to develop a method for streamlining the proceedings without denying due process or violating the rules of civil procedure."

Five serious impediments to adjudications are listed: 1) inaccurate and/or insufficient information; 2) disagreements between major parties over questions of law; 3) institutional resistance to expedited proceedings; 4) structural impediments in issuing individual water right decrees; and 5) procedural duplication. NMSU suggests gathering information up-front, structuring cases to allow negotiation between major parties, laying sufficient procedural foundations, obtaining adequate funding, and structuring cases to require negotiations.

The State Engineer Office suggests that ADR may be much more cost effective than a long, expensive and cumbersome full adjudication process. Both parties agree that a commitment to consensus building within the negotiation process will be critical to insuring the success of any ADR methods.

### Town Hall to Tackle Water and Land Resources

New Mexico First, a nonprofit, nonpartisan public policy group formed in 1986 by Senators Bingaman and Domenici, will focus its next Town Hall meeting on how to better manage the state's water and land resources. The meeting will take place in Albuquerque on June 26-29.

One key question Town Hall participants will address: What are the consequences to supply, demand and quality of life if New Mexico continues its present water and land-use patterns and practices?

The New Mexico WRRI prepared the background research report for Town Hall participants. The report included an overview of water and land resources in New Mexico, New Mexico water law and its administration, the area's basic hydrology, geographic breakdown of water use in the state, regional supply and demand projections, water transfers in New Mexico, and public welfare considerations applicable to New Mexico law.

The very first Town Hall meeting was held in Angel Fire in May 1988 and focused on water issues. The New Mexico WRRI prepared the background report for that meeting also.

### AWRA Offers Student Awards

The American Water Resources Association has announced several student paper competitions to be held at the AWRA's 33rd Annual Conference and Symposium, October 19-23, 1997, in Long Beach, California.

Award #1, given by Hydrolab Corporation, will be for the Best Student Paper Presentation at the annual meeting. This award includes a \$300 prize and one year's membership in AWRA.

Award #2 and Award #3, given by UCOWR and AWRA, include one award for the best undergraduate paper and one award for the best graduate paper. Each of these awards includes a \$250 prize and one year's membership in AWRA.

Interested faculty and students can contact Cathy Ortega Klett at the WRRI (505-646-1195 or [coklett@wrri.nmsu.edu](mailto:coklett@wrri.nmsu.edu)) for more information.

### Congratulations

**New Mexico Tech's Hydrology Program** was rated among the nation's best according to *U.S. News and World Report's* annual rankings of graduate schools. The program was tied with Penn State University as the nation's fourth-best in the specialty area of hydrogeology, behind much larger schools such as the University of Arizona, the University of Wisconsin at Madison, and Stanford University, the top three in order of ranking.



## WRRRI Reference Library a Wealth of Water Information

The institute's reference library boasts over 8,000 water-related reports as well as detailed maps of New Mexico's river basins, newsletters from water-related agencies, slides, and some institute-produced video tapes.

Although some of the resources available are contained in other libraries, the institute's reference room brings together water-related information in one convenient location. The collection includes general information about water resources use, development, management and history.

"We encourage students, faculty and anyone interested in water to take advantage of this resource and now with the ability to search the collection using the WRRRI home page, it's very easy to find out quickly whether we have the materials they need," said Tom Bahr, WRRRI director.

WRRRI staff member, Cynthia Rex, oversees the reference library. Cynthia catalogs new materials and enters the information on a computer database that can be searched using keywords, report title, or author.

Publications are shelved alphabetically by publishing state or country. Within these categories, reports are further classified by agency and keywords.

Federal publications contained in the library include U.S. Geological Survey water-supply papers, open-file reports, water resources investigations, streamflow data and maps. Also included are reports from the Environmental Protection Agency,



*Cynthia Rex and student assistant, Thomas Smelker, maintain the WRRRI reference library.*

Bureau of Reclamation, Bureau of Land Management, Army Corps of Engineers, and the Fish and Wildlife Service.

Technical and annual reports from the New Mexico State Engineer Office and geological/hydrological reports from the NM Bureau of Mines and Mineral Resources are available. Other state-issued reports derive from the New Mexico Environment Department and New Mexico Water Quality Control Commission.

The WRRRI technical report series, water conference proceedings, and miscellaneous reports, including the much requested *New Mexico Water Rights* and the *New Mexico Water Directory* are available. Other available information includes NMSU Agricultural Experiment Station reports and bulletins.

Reference materials are meant to be used in the library but reports can be checked out on a limited basis.

"Our busiest time of year for use of the reference room is at the beginning and end of each semester when students are scrambling to start or complete research projects—many faculty on the NMSU campus are familiar with what we have and ask their students to check us out," remarked Cynthia recently. "We also are especially busy during the summer with faculty searching for research materials."

The *NMWRRRI Reference Library* is the most popular "hit" on the WRRRI home page. Browse and conduct searches via the Internet at <http://wrrri.nmsu.edu>.

The WRRRI reference library is open Monday through Friday, 8:00 a.m. to 12:00 noon and 1:00 p.m. to 5:00 p.m. Call Cynthia Rex at 505-646-1813 ([crex@wrrri.nmsu.edu](mailto:crex@wrrri.nmsu.edu)) for more information or assistance. She is available and happy to help conduct searches.



## Call for Papers

# Water Issues of Eastern New Mexico: Get Your Water Kicks on Route 66

October 2-3, 1997

Tucumcari Convention Center

The New Mexico Water Resources Research Institute and the American Water Resources Association, New Mexico Section will hold the 42nd Annual New Mexico Water Conference in Tucumcari, New Mexico. This conference will offer attendees the opportunity to learn about water issues in eastern New Mexico and be brought up to date on water issues around New Mexico. The day-and-a-half program will include an optional tour of Conchas Dam on Wednesday afternoon, October 1, 1997.

Any paper related to water resources in New Mexico will be considered; papers relevant to eastern New Mexico are especially encouraged. Each presentation will be a 15-minute talk with a 5-minute question/answer period. You are invited to submit an abstract on topics including, but not limited to the following.

Water Development	Wetland Conservation
Hydrology	Regional Planning
Groundwater Modeling	Agricultural Water Conservation
Aquifer Storage and Recovery	Innovative Water Technologies
Conjunctive Use of Surface Water and Groundwater	Alternative Dispute Resolution
Data Collection and Analysis	Drought Management
Water Quality Issues Related to Agriculture or	Weather Modification
Livestock Industries	Riparian Ecosystems
Watershed Management	Interstate Groundwater Compacts

Submit three (3) copies of the abstract, not to exceed one typed page, by **July 15, 1997** to the WRRI. Include your name, affiliation, mailing address, telephone and fax numbers and email address. Note whether you will need audio/visual equipment. Decisions concerning accepted abstracts will be made by July 31, 1997. All papers presented at the conference will be included in a proceedings. Papers on diskette are due at the conference.

Please send abstracts and/or direct questions to:  
42nd Annual New Mexico Water Conference  
Attn: Cathy Ortega Klett  
New Mexico Water Resources Research Institute, MSC 3167  
New Mexico State University  
Box 30001  
Las Cruces, New Mexico 88003  
Phone: (505) 646-1195 Fax: (505) 646-6418  
Email: coklett@wrri.nmsu.edu



## WRRI Reports Available

Last year's water conference proceedings, *Integrated Water Resources Management: Northwestern New Mexico as a Case Study*, has been published and sent to all conference participants.

The 41st Annual New Mexico Water Conference was held in Farmington last September. Included in the proceedings are papers from each of the speakers. Al Utton, UNM law professor, provided an overview of the history and politics of the Colorado River Basin over the past 100 years. Phil Mutz, consultant to the Interstate Stream Commission outlined the area's important water issues. Steve Semken, a Navajo Community College instructor, provided an informative description of the region's geology and hydrogeology.

The water resources issues of the area were discussed by New Mexico State Engineer Tom Turney; Bruce Whitehead, of the Colorado Division of Water Resources; and Stanley Pollack, attorney for the Navajo Nation.

Charles Calhoun, Regional Director of the U.S. Bureau of Reclamation gave the keynote address. Mr. Calhoun discussed a number of issues facing the basin which "...all come back to, or revolve around, meeting the needs of the endangered fish and the potential tribal rights that are yet to be quantified..."

One of two panels discussed endangered species recovery on the Colorado River and its implications. Another panel discussed the controversial and often contentious Animas-La Plata Project.

Other papers were given on the region's oil and gas industry by William Olson of the Oil Conservation Division; the coal industry by Charles Roybal of BHP Minerals; oil, natural gas and groundwater in the San Juan Basin by NM Bureau of Mines and Mineral Resources geologist Ron Broadhead; and groundwater issues related to coal-bed methane production by Steve Finch of John Shomaker & Associates.

Richard Cheney, a member of the Interstate Stream Commission, discussed the area's regional water planning. Santa Fe's water planning efforts during the drought were addressed by City of Santa Fe staff, Sherry Tippett and Mike Hamman.

Copies of the proceedings are available for \$15.75. Request WRRI Report #302 by calling the WRRI at (505) 646-1813. Orders will need to be prepaid.

## Technical Report #301

*Determining the Toxicity of Herbicides Using a Novel Method* by NMSU Professor James L. Botsford has been published by the WRRI as part of its technical report series.

The study demonstrated the utility of a new assay for measuring toxic chemicals. The assay used the bacterium *Rhizobium meliloti* as the indicator organism to measure the toxicity of 30 herbicides used on the NMSU farms. The assay is simple, fast and inexpensive. Study results indicated the method can be used to follow the disappearance of toxicity in soil. Further study will include experiments to correlate disappearance of the toxicity with disappearance of the chemicals measured with analytical methods.

Contact Cynthia Rex (505-646-1813; crex@wrri.nmsu.edu) for a copy of the report.

## Workshops and Conferences

AWRA/UCOWR Annual Symposium, *Water Resources Education, Training and Practice: Opportunities for the Next Century*, Keystone, Colorado - June 29-July 3, 1997

NWRA, 1997 Western Water Seminar, *Watershed Protection Symposium*, Park City, Utah - July 30-August 1, 1997

American Society of Civil Engineers, *27th International Association for Hydraulic Research Congress*, San Francisco, California - August 10-15, 1997

Idaho WRRI, *Connections '97: Groundwater in the Rocky Mountain Region*, Boise, Idaho - September 24-26, 1997

**NMWRRI, 42nd Annual Water Conference, Tucumcari, New Mexico - October 2-3, 1997**

Water Environment Federation, *WEFTEC '97*, Chicago, Illinois - October 18-22, 1997

Arizona State University's Center for the Study of Law, Science, and Technology, *Symposium on Environmental, Economic and Legal Issues Related to Rangeland Water Developments*, Phoenix, Arizona - November 13-15, 1997

American Water Works Association, *Water Reuse '98*, Orlando, Florida - February 1998

First Federal Interagency Hydrologic Modeling Conference, *Bridging the Gap Between Technology and Implementation of Surface Water Quantity and Quality Models in the Next Century*, Las Vegas, Nevada - April 19-23, 1998



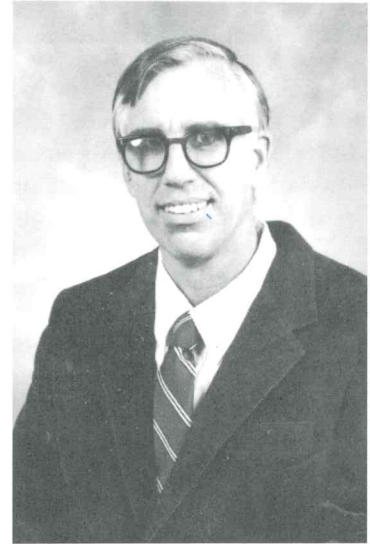
## KUDOS

After a lapse of nearly a decade, New Mexico again has a state climatologist responsible for providing statewide climate information. **Ted Sammis**, a hydrologist with NMSU's Agricultural Experiment Station, assumed the post in January.

Unlike a meteorologist, a climatologist does not provide weather forecasting or up-to-the-minute bulletins. Through a computerized collection system, Sammis can provide statewide weather data from the day before, as well as

historical climate information and agricultural applications. His focus will be on how climate affects the environment, including the state's people, land, rivers and lakes.

Sammis, who will devote about 40 percent of his time to climatology work, has been active in creating the New Mexico Climate Center on the WWW (<http://weather.nmsu.edu>). The site includes weather data, lawn watering guides and hydrologic information about lakes and rivers. It also has computer weather applications to help farmers schedule irrigation, conserve water and manage pests and diseases.



**John L. Wilson**, professor of hydrology at New Mexico Tech, was named this year's recipient of the O.E. Meinzer Award at the Geological Society of America (GSA) annual convention in Denver. The award is given annually by the GSA's Hydrogeology Division Council to the author or authors of a published research paper or body of papers of distinction which have advanced the science of hydrogeology or related fields.

According to Tech, Wilson's current research interests are directed toward the characterization, protection and remediation of

underground drinking water supplies. Through this work, he has been examining the movement of dissolved chemicals, nonaqueous phase liquids, such as gasoline, and colloids and bacteria in porous and fractured media.

The Meinzer Award, established by the GSA in 1963, is named for Oscar Edward Meinzer (1876-1948) whom hydrologists consider "the father of modern groundwater hydrology" in North America.

Wilson served on the WRRRI Program Development and Review Board from 1989-1996.



The Board of Directors of the National Water Resources Association elected **Wayne P. Cunningham** as the Association's 30th President. Wayne is the Water Policy Analyst for the New Mexico Department of Agriculture and was appointed by the Governor to represent New Mexico on the Western States Water Council. He has served as a member of the NWRA's Board of Directors since 1978.

As President, Cunningham says he is interested in pursuing compromises which enhance and protect the quality of our natural

environment while recognizing the importance of water for agriculture, state primacy, and protection of municipal source water. "Continued water resources development and the unfulfilled commitment of the federal government in some regions of the West must be addressed in a meaningful and timely manner."

We wish Wayne, who has served for many years on the WRRRI Water Conference Advisory Committee, the best of luck during his two-year tenure as President of NWRA.





## USGS Reports

The U.S. Geological Survey has published the following New Mexico related publications since the last issue of the *Divining Rod*. Copies are available for inspection at the USGS District Office in Albuquerque (4501 Indian School Road NE, Suite 200). The Water Resources Research Institute library also has the reports on file. They may be ordered from the USGS, Federal Center, Box 25286, MS 517, Denver, CO 80225. You may call 303-236-7476 for price information.

\* **Water-quality and ground-water-level data, Bernalillo County, central New Mexico, 1995** by Dale R. Rankin (OFR 96-578)

\* **Water-quality assessment of the Rio Grande Valley, Colorado, New Mexico, and Texas - Shallow ground-water quality of a land-use area in the San Luis Valley, south-central Colorado, 1993** by Scott K. Anderholm (WRIR 96-4144)

\* **Ground-water quality, water year 1995, and statistical analysis of ground-water-quality data, water years 1994-95, at the Chromic Acid Pit Site, U.S. Army Air Defense Artillery Center and Fort Bliss, El Paso, Texas** by Cynthia G. Abeyta and Raymond G. Roybal (WRIR 96-4211)

\* **Water-level data for the Albuquerque Basin, New Mexico, period of record through September 30, 1995** by Dale R. Rankin (OFR-96-664A)

\* **National Water Summary on Wetland Resources**, a 431-page, full-color report is published as USGS Water-Supply Paper 2425 and is available for \$49 from the GPO. To have an order form faxed to you, call 703-648-4888, select option 3, then option 2 and enter document number 5100. Single copies of the New Mexico section of the report are available from the USGS New Mexico District office in Albuquerque.

\* **Ground-water resources of Catron County, New Mexico** by George T. Basabilvazo (WRIR 96-4258)

\* **Water-quality assessment of the Rio Grande Valley, Colorado, New Mexico, and Texas—Ground-water quality in the Rio Grande Flood Plain, Cochiti Lake, New Mexico, to El Paso, Texas, 1995** by Laura M. Bexfield and Scott K. Anderholm (WRIR 96-4249)

\* **U.S. Geological Survey Middle Rio Grande Basin Study—Proceedings of the First Annual Workshop, Denver, Colorado, November 12-14, 1996** by James R. Bartolino, editor (OFR 97-116)

\* **Water-quality assessment of the Rio Grande Valley, Colorado, New Mexico, and Texas - Organic compounds and trace elements in bed sediment and fish tissue, 1992-93** by Lisa F. Carter (WRIR 97-4002)

\* **Chlorofluorocarbon and tritium age determination of ground-water recharge in the Ryan Flat Subbasin, Trans-Pecos Texas** by James R. Bartolino (WRIR 96-4245)



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### THE DIVINING ROD

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