divining rod

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Institutes under new direction

The federal government began its fiscal new year Oct. 1 with several actions affecting water resources research. The major news out of Washington is that Congress has directed the Department of the Interior to turn over administration of the nationwide water institute program to the U.S. Geological Survey.

"The USGS has a long history as a respected, solid agency," said Thomas G. Bahr, WRRI director. "I think the institute program will benefit from this new association."

Institute directors met with USGS representatives in Washington, D.C., Oct. 26-27, to discuss ideas on program management. Bahr reported that the USGS will not make any program changes until after the first of the year.

In the 20 years since the institutes were established, they have been the administrative stepchild of several agencies. From 1964 to 1978, they were under the Office of Water Resources Research (OWRR). In 1978, OWRR merged with the Office of Saline Water to become the Office of Water Research and Technology (OWRT). When OWRT was abolished in 1982, the institutes came under the wing of the Office of Water Policy (OWP).

On Oct. 1, when Congress failed to renew OWP funding, that office was dissolved. "The institute program was viewed as being too close to politics under the Office of Water Policy. It is important to insulate research from political influences, even though research must be responsive to political constituencies," Bahr said. He headed the OWP from 1982 until May 1983.

In other action, the House of Representatives passed HR 2911 reauthorizing funding for water institutes. After some modification, the bill also passed the full Senate Nov. 18 with an authorization budget of $10 million for water institutes, $20 million for matching grant research and $6 million for technology development.

The bill also would turn over the Roswell Desalting Test Facility to the city of Roswell, N.M., and the Wrightsville Beach Desalting Test Facility to the city of Wrightsville Beach, N.C., as of Dec. 31, 1983. Under the conditions of ownership, the lands and facilities must continue to be used for public purposes. The bill now goes back to the House where approval of the modifications and passage are expected.

Roswell is now operating its facility under a cooperative agreement with the federal government. The WRRI is conducting a two-year, $500,000 research program in association with the Roswell facility.

Conference to focus on water law

The 29th Annual New Mexico Water Conference will be held April 26-27, 1984, in Las Cruces. The conference, entitled "Water Law in the West" will cover the concerns of managing water resources in an uncertain legal climate.

The conference begins Thursday, April 26, with an overview of New Mexico's water laws including those governing water rights. Speakers from neighboring states will discuss how their state water laws address problems specific to the arid West. A report from New Mexico's Water Law Study Committee also will be presented during this session.

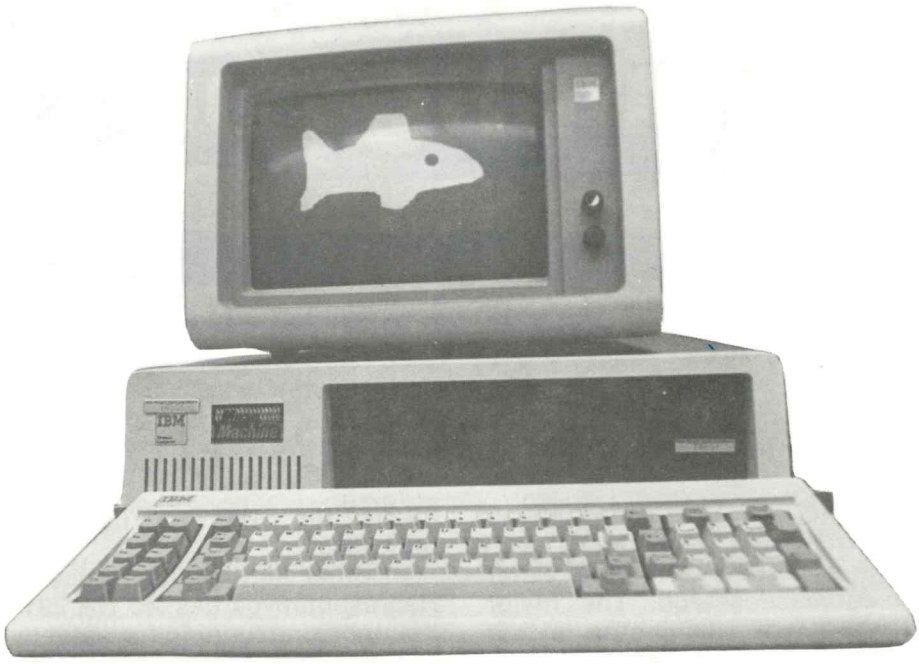
The afternoon session will cover interstate legal disputes affecting New Mexico's water. The *El Paso* case as well as disputes over the Pecos and Vermejo rivers will be discussed.

Indian water rights will be the topic discussed Friday, April 27. A summary of the laws affecting Indian water rights, including the Winter's Doctrine, will lead off this session. Speakers will discuss the 17-year-old *Aamodt* case, which has just been heard in court.

For the first time in 10 years, student papers on water-related topics will be presented at the conference. Finalists will be chosen to make a presentation at the conference and compete for a cash award.

A conference program and registration form will be available later. For more information, call the institute at 505/646-4337.

Sport fishing management gets assist from computer



This fish story could not be told, at least in this century, if it were not for that bright cousin to the calculator—the computer.

Ask Dick Cole. He heads a research team that is using computers to model sport fishing management policies in New Mexico's Rio Grande reservoir system.

A scientific model, explained the New Mexico State University aquatic ecologist, is basically a series of interconnected graphs showing where "x" causes "y." For the sport fishing model, the researchers also are constructing graphs. "Only now," said Cole, "we're using a computer."

Cole and NMSU research team members hydrologist Tim Ward and natural resource economist Frank Ward, are taking advantage of today's "friendly" computers to do their number crunching.

The computer model will help the New Mexico Department of Game and Fish determine the best investment of the $550,000 federal funds the agency receives each year for sport fishing in the state. A proposed federal user's tax on fishing tackle could increase that total to $1.5 million. The money could be spent on research, development projects, or water rights for fishing. Sport fishing adds $100 million to the state's income each year.

Although most of the water in the Rio Grande is apportioned for irrigation and downstream use in Texas, there is some flexibility, some option, on where, how much and when water is released for those purposes. For example, water released from an upstream reservoir for irrigation downstream could be timed so that the increased flow coincides with the fishing season. This option could improve fishing while still meeting the irrigation and legal requirements of the water right.

Working within legal and hydrologic boundaries, each researcher is computing the results of each option in his research area. For example, Tim Ward's hydrologic computer model simulates water level fluctuations in the systems six reservoirs and their connecting waters.

"If you hold water in Abiqui Reservoir," the hydrologist said, "you are also holding back water from downstream reservoirs such as Elephant Butte. That decision may increase fishing in Abiqui and please the anglers near Albuquerque, but what will happen to the fishing at Elephant Butte and the economy at Truth or Consequences?"

His hydrologic model also can simulate mass movements of water and their effects on sediment load, plant nutrients and light penetration. He said Cole uses this information to classify fish habitats.

One of the project's major goals is to develop a model that predicts water level fluctuations. The researchers say that by predicting a given water level at a given reservoir, Game and Fish could, for example, stabilize the water level in one reservoir to increase spawning, or move that water downstream to another reservoir to improve fishing.

The goal is not unrealistic. The amount of snowmelt, which provides about 85 percent of the state's surface water, is known by March or April each year. Rainfall, which is less predictable, makes up the remaining 15 percent.

Water level is the prime factor in Cole's biological computer model. Water level affects fish production from spawning to survival to growth. Even a six-inch fluctuation in the reservoir level can affect spawning.

Cole also is looking at how water levels encourage production of food for fish. Because each fish species feeds on specific plants and animals, the type of food available helps determine where a fish lives.

Zooplankton, tiny animals such as water fleas, are fare for shad and minnows. In turn, these young fish are eaten by bass and walleyes —sport fishing favorites. Algae, sometimes unkindly tagged as "frog spit," is a major food supply for zooplankton, which, in turn, are eaten by sunfish, minnows and other small fish. Zoobenthos, a palatable name for worms and fly larvae, live on the lake bottom and are food for carp, suckers and most small game fish.

Frank Ward is using his computer to attach a dollar value to each option in Cole's biologic model and Tim Ward's hydrologic model. He said although the angler may not be aware of it, state agencies are trying to determine how best to spend the taxpayer's money in buying water rights for fishing. His task is to determine

the value of the water used for fishing.

First, he is measuring the water value in terms of what a fisherman is willing to pay for the fish. "It's not as easy to measure as the price you pay for an orange at the supermarket," he said.

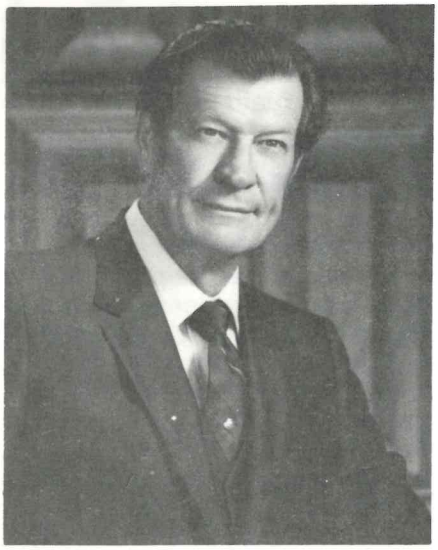
Instead, the "pricetag" is determined by factors such as how far the angler is willing to travel to the reservoir, how many times a year he makes the trip, and how many fish he catches each time. To find this out, Frank Ward asked the fishermen in questionnaires distributed at 14 locations on the Rio Grande system.

The 1981 survey showed that the typical angler was willing to pay a per trip "pricetag" of about $35 for coldwater fishing and $27 for warm water fishing. Each cold water fish caught was worth about $6.50 to the angler, and each warm water fish was worth $2.50.

He also is measuring the value of the water based on the impact of fishing on the recreational economy. He said, for example that construction of a new reservoir can lead to an increase in the income and employment in the area, especially from bait shops and motels. This spin-off economy is valued "over and above what a fish is worth," he said.

The three researchers meet most Wednesdays for a lively discussion of their progress. Lately, they have been joined by a computer specialist who will work at making their computer program "user friendly." The "users," however, will be agencies, not fishermen.

Endowment planned



An endowment is being set up to honor NMSU President Gerald W. Thomas.

A citizen's group has launched a $1 million fund raising drive to establish an endowed chair honoring New Mexico State University President Gerald W. Thomas. The endowed chair will be in food production and natural resources, areas in which Thomas has made significant contributions.

Fund drive Chairman Jim Ikard said the chair would honor the retiring NMSU president who has said he believes the future of New Mexico hinges on the state's natural resources. Thomas is not only a capable administrator but also an authority on world food problems. He has received international recognition in agriculture, ecology and resource management, Ikard said.

The endowment will aid further economic development in the state by attracting noted scholars and researchers to the university. A national figure in water resources, for example, who might not be available on a permanent basis, might be brought to the campus for a one-year term.

The position always will be identified as the Gerald W. Thomas Professor of Food Production and Natural Resources. The professor could be a teacher or a researcher in water resources, soils, or other areas in the natural resources field.

Ikard said the committee hopes the 1984 Legislature will establish a matching fund program that would provide half of the endowment, but he said the establishment of the chair will not depend on a legislative appropriation.

Ikard said the income from the $1 million permanent endowment, a guarantee of about $100,000 annually, could support a continuing line of distinguished teachers and researchers in many fields related to natural resources and food production.

Donald Roush, executive vice president of NMSU, said the proposed endowment would be the largest single contribution ever made to NMSU. He said the NMSU Foundation, the primary force behind the endowment drive, hopes to reach its goal of $500,000 in pledges by the end of 1984. He said the drive has collected about $100,000 since plans for the endowment were announced in late October.

Ikard said the group will appeal to corporations, individuals, organizations and NMSU alumni, of whom more than 50 percent graduated during Thomas' term as president.

Oklahoma hosts ground water meet

The Second International Conference on Ground-Water Quality Research, sponsored by the National Center for Ground Water Research and the U.S. Environmental Protection Agency, will be held March 27-29, 1984, at the Williams Plaza Hotel, Tulsa, Okla.

The conference will focus on the physical, chemical and biological processes that control movement and fate of contaminants in subsurface water. The topics to be presented include: investigative methodology, biological and nonbiological transformations, sorption, and transport processes. The registration fee is $100 until March 1, 1984, when it increases to $120.

For more information contact Norman N. Durham, University Center for Water Research, Oklahoma State University, 203 Whitehurst, Stillwater, Okla. 74078 or call 405/624-6995.

Water suit options discussed

While appeals in the *El Paso* case await court action, New Mexico is laying legislative groundwork to reduce the adverse consequences of the ruling. The interium Water Usage and Resources Committee, which was formed in response to concern over the *El Paso* ruling, has been hearing testimony from several experts in preparation for the January 1984 legislative session.

The *El Paso* ruling stated that New Mexico cannot ban out-of-state export of its ground water because such a ban violates the Commerce Clause of the U.S. Constitution. New Mexico has since enacted a new law that allows controlled ground water export.

In committee testimony Oct. 28, Thomas G. Bahr, WRRI director, said New Mexico should devote itself not only to protecting its water supplies, but also to initiating plans for importing water from out-of-state.

New Mexico Attorney General Paul Bardake, in a letter to the committee, said that if the state adopted Bahr's proposed plan, New Mexico "would face significant legal and economic obstacles."

Bahr, in a letter to the committee, said that while he agreed with Bardake, "New Mexico should not limit its efforts to any single thrust, but rather pursue all options."

He said New Mexico's planning strategy should not be constrained by today's economic, legal and political situations. "We need to know if we can obtain rights to out-of-state water in the distant future regardless of whether or not we ever choose to exercise those rights," he said.

He said while the protection of New Mexico's present water supply should remain the state's highest priority, the state must be willing to explore all rational alternatives, including water importation. Texas and Arizona, he said, already include water importation in their state water plans.

Committee Chairman Rep. George Fettinger, D-Otero, suggested that Bahr meet with the attorney general to follow up on out-of-state opportunities for water rights.

The legislators also heard testimony from State Engineer Steve Reynolds on a comprehensive study of the state's water resources. Reynolds said the study would inventory the current availability and uses of state water. The committee said it would ask the 1984 Legislature to approve $500,000 for the study, which could be complete by mid-1987.

The Water Law Study Committee testified on projections of the water needs of neighboring states, which would help pinpoint those that expect shortages in 40 years and might look to New Mexico to make up the shortages.

Texas, one of the states with a projected deficit, has made water importation an explicit part of its state plans, said Lee Brown, a resource economist at the University of New Mexico.

However, Texas has looked to the Mississippi River for its supplemental source. The El Paso water suit, he said, is a "sort of aberration" and does not seem to reflect state policy.

Charles DuMars, chairman of the Water Law Study Committee, told the legislators that because the state's surface water is already apportioned, any claims to New Mexico water will be for its ground water.

He said the state has the option to appropriate to itself, any unappropriated water, effectively "taking it out of the market." DuMars said another option the committee might recommend is a moratorium on ground water appropriations while the state assesses its resources.

But, DuMars said, "You start talking moratorium on ground water, and you had better be sure you're not affecting the economic development of the region."

The Water Law Study Committee will present its final report Dec. 31 to legislators with suggestions for revising New Mexico's water laws.

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