

Wildflowers brighten the desert; weeds add somber note

The past season's generous rains replenished reservoirs and brought forth vegetative abundance, both wildflowers and weeds. A plethora of desert wildflowers is appreciated for providing a colorful bonanza, whereas a robust growth of weeds is viewed as an unwelcomed intruder, even a hazard. In urban areas weeds clutter the landscape; in desert and forested areas weeds and grasses dry out and become tinder for wildfires.

Perhaps, however, weeds deserve more consideration. Perhaps their abundant presence this spring could be seen as a healthy reminder that a season of generous rain doesn't solve all problems. Everything isn't coming up wildflowers, and the drought likely remains a threat despite the appreciated relief — and despite the glorious wildflowers.



Weed Photo: Joe Gelt

Flower Photos: Val Little



Interbasin Groundwater Transfers Revisited

Rural areas now see advantages to once rejected option

by Joe Gelt

Interbasin groundwater transfers are a strategy to obtain additional water supplies in parts of the state with inadequate water resources. It is a strategy, however, fraught with legal obstacles in Arizona due to passage of the 1991 Groundwater Transportation Act and subsequent amendments. Passed in response to rural concerns, the GTA essentially prohibits the transfer of groundwater from one hydrologic basin in the state to another.

Some rural officials, although their interests were primarily served by the law, are now having second thoughts about interbasin groundwater transfers. Some are now viewing such transfers in a more positive light, as a possible strategy to acquire additional water supplies for rural communities.

(Some foresaw possible trouble ahead when rural interests were urging passage of the GTA. A Salt River Project manager reminisces that he once advised rural officials at the time to be cautious of what water transfer restrictions they advocated until "they decide what they want to be when they grow up.")

Water Farming Controversy

The irony of this position is best appreciated if one considers developments lead-

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ing up to the passage of the GTA. Water farming was an issue in Arizona water affairs in the late 1980s. Land purchased in rural basins for its appurtenant water was called a "water farm" or "water ranch." With the land purchased, the water then could be used for purposes other than agriculture; e.g., it could be piped to urban areas which was in fact the planned destination for most of the water expected to be obtained from water farms.

Water farming provoked controversy. On one side of the issue were various municipalities within Active Management Areas. With their groundwater pumping restricted by the 1980 Groundwater Management Act, municipalities sought additional water supplies to support growing populations. They viewed water farming as a means to transfer the state's limited water supplies to areas of greatest need, from an economically lower-to higher-valued use; in other words, from rural to urban areas.

Many in agricultural areas, however, considered water farming a problem, not an opportunity. They believed that agricultural areas would be pillaged of their vital water resources. Short-and long-range economic costs to such areas could result. Although some landowners might make money by selling their land, the loss of farm income due to retired farmlands could affect existing businesses in the area. Further, abandoned farmland could be an environmental liability: thus passage of the GTA.

The statute provided a few exceptions to the prohibition of interbasin water transfers. For example, an exception was granted for certain agreements that were in effect before passage of the GTA; e.g. agreements in the Big Chino Subbasin and the Harquahala Irrigation Non-expansion Area. Also, in response to several years of drought, amendments to the GTA provide for short-term trucking of groundwater between basin boundaries, if a permit is obtained from the Arizona Department of Water Resources.

Transfers Gain Appeal

Restricting transfers seemed like a good idea back then, but the GTA is now being questioned by those who were presumed to benefit most from the law. What has changed? What has caused some rural officials now to regard water transfers more positively, as a possible strategy to acquire additional water supplies for their communities? Greatly contributing to the changed attitude is the growing realization that water supplies in various rural areas are not adequate to meet community needs. Several developments prompted this realization.

In the 1990s, the growth rate in rural areas of the state exceeded all projections. In search of a life style change, many people were drawn to the attractive natural settings of rural areas. Some newcomers came to the area to build second residences and retirement homes. To accommodate this growth rural areas needed sufficient water supplies.

Also in the late 1990s drought conditions were increasingly becoming a worry, further taxing available water resources and raising concerns about future supplies. Rural officials were thus confronted with the question: What options are available for acquiring new and additional water supplies? With CAP water not readily available to rural areas, options for acquiring new water resources are limited. Interbasin water transfers might be an option if legal complications

could be resolved.

Current discussions are concerned with rural interest in interbasin transfers of groundwater. No one is apparently interested in turning back the clock and promoting interbasin transfers from non-AMA to AMAs.

Reception for Bonnie G. Colby, co-author of "Negotiating Tribal Water Rights"

A May 10 reception will be held at the University of Arizona's Water Resources Research Center for Bonnie Colby to celebrate publication of her new book. Colby, along with John E. Thurston and Sarah Britton, wrote "Negotiating Tribal Water Rights, Fulfilling Promises in the Arid West." The book offers an introduction to the ongoing challenges tribal claims present to western water management. Hosting the reception are the WRRC and the UA Center for Sustainability of Arid and semi-Arid Hydrology and Riparian Areas. For more information click Announcements on the WRRC web page: <http://ag.arizona.edu/azwater/>

Muted Message

Although rural communities are recognizing the potential value of interbasin transfers — one official said "it would be an incredibly useful tool to have in rural Arizona communities' war chest" — they are raising the issue cautiously. Neither at the proposal stage nor at the point of formal discussions, interbasin transfer is not an issue that is officially on the table. A state water official described whatever conversations are occurring on the topic as "sort of a buzz."

There is a reason for this: officials are being cautious about advocating for transfers because the full consequences of allowing interbasin water transfers among rural areas is not known. Consider the political implications of the following questions: Who would benefit from allowing interbasin transfer of water? What areas or communities would serve as areas of origin for water transfers? What would be the likely effect of water transfers on such areas? In other words, winners and losers are likely; community leaders don't want to be blamed for an unexpected and unpopular outcome.

Not helping the situation is the dearth of information about hydrological and geological conditions in some rural areas of the state. Rural areas of the state have received less support than AMAs for managing their water resources. For example, since 1984, well operators who pump over 35 gallons per minute from a well within an AMA are required to keep records of their pumpage and report amounts to ADWR. Pumpage information outside of AMAs is generally lacking because metering is not required. With a lack of such basic information as the amount of water within an aquifer and its rate of depletion, rural officials are not likely able to make informed decisions about groundwater transfers.

More will be likely to be heard in the future about interbasin transfers in rural areas of the state. As rural communities individually and collectively work out their water future they may find that the interbasin transfer of groundwater, a concept they once found objectionable, could very much work to their advantage. ■



Water Vapors

WRRC Conference Addresses Ecosystem Restoration

One of the more obvious conclusions arising from the Water Resources Research Center's recent conference, "Water and the Environment: The Role of Ecosystem Restoration," is that ecosystem restoration projects are many, varied and wide-ranging — and many and varied are the organizations and agencies undertaking the work.

At least one of the organizations represented at the conference is relatively new to the activity. The conference opened with Bill Dawson of the U.S. Army Corps of Engineers who reflected that his agency has not traditionally been considered an ecosystem restorer. That the Corps is now doing its part to restore ecosystems indicates the emerging importance of the issue.

Sharing a common commitment with the Corps is rancher Jim Crosswhite, another conference participant. Like the Corps, ranchers traditionally have not been thought to be committed to ecosystem restoration; yet Crosswhite described at the conference steps he was taking to restore and protect environmental conditions at his EC Bar Ranch in Nutrioso.

From a large federal agency to an individual rancher, those involved in ecosystem restoration activities cover a wide range of interests. From the Lower Colorado River Multispecies Conservation Program to a restored stream channel on the EC Bar Ranch, the types of ecosystem restoration projects range far and wide in size and complexity. This then was what the conference was about: a wide range of interests involved in projects ranging far and wide in size and complexity.

The conference was an opportunity for various agencies or organizations to showcase ecosystem restoration projects in which they are involved. Maricopa County, Pima County, City of Phoenix, Salt River Project, U.S. Geological Survey and researchers at Northern Arizona University, Arizona State University and the University of Arizona

Ecosystem Restoration by the Freeway



Photo: Flood Control District of Maricopa County

Above was one of the oddest restoration projects discussed at the WRRC conference. Presented by Mike Ellegood of the Flood Control District of Maricopa County, the scene is a study in contrast: a wetland with grasses and trees, with two major Phoenix area freeways, Loop 101 and Loop 202, in the background. Once again, it would seem, the environment is taking a beating, this time violated by the intrusion of high-rise freeways. But it is not as simple as that.

The above is a naturally occurring wetland that formed in the area; it is an environmental restoration project that developed without human intervention, neither designed nor constructed and requiring no funding. Its origins can be traced to

the 1993 flood which scoured out an indentation. The indentation then filled with water; birds began showing up, transporting seeds and vegetation grew.

Beavers now live and reproduce in the wetland that receives water from the City of Mesa's wastewater treatment plant and freeway drainage. It is known far and wide as an excellent birding site because of the many and various birds it attracts. A wetland island serves as a rookery for snowy egrets.

Efforts to have the Audubon Society recognize the wetland as a birding site were unsuccessful because of the proximity of the freeway: bird songs are heard against the backdrop of traffic noise, and highway trash litter land and water.

described their ecosystem restoration work. Conducted in Tucson, the April 6 event was the latest in WRRC's series of annual

conferences addressing state water issues. The series is an outreach service to the Arizona water community and the public



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News Briefs

Cave Creek Wants Public Water Utility

A small town in Arizona is confronting an issue that is of importance nationally, even globally: the issue of public vs. private ownership of water utilities.

Incorporated in 1986, Cave Creek has been served by the Cave Creek Water Co., a private water utility, for the past ten years. The town has been negotiating with the utility for three years in an effort to purchase it. As a result town officials were chagrined when they discovered that the utility was sold on March 3 to Global Water, another private water company.

A principle is at stake in the issue. Cave Creek Town Manager Usama Abujbarah says, "Our philosophy toward water is that it has to do with public health, safety and welfare and is not a business for profit. We need to guarantee that in the future the water services will be provided without any interruption and that it will be safe."

Also, Abujbarah is concerned that a private water company, concerned with the bottom line, may not pursue water policies that are in the best interest of the public.

With their efforts to purchase and operate the utility gone for naught, officials are determined to take action to acquire the water company either through purchase or eminent domain. The town council approved this course of action March 21. Efforts to negotiate a purchase with the new owner were not successful.

Abujbarah says, "We talked with Global Water but the response we got from them about a friendly purchase was not friendly. They are not willing to sit down with us so far. Because of that we hired a law firm to file for condemnation."

Eminent domain is a strategy available to Arizona municipalities for acquiring utilities or private property if it is to the advantage of the community. It can involve lengthy court cases, with a judge often deciding a sales price, although such cases usually conclude with a negotiated settlement.

ADWR Deputy Director Appointed

Arizona Department of Water Resources Director Herb Guenther has named Karen Smith as deputy director of the agency. Smith will be leaving her position as director of the water quality division of the Arizona Department of Environmental Quality, a position she held since 1998, to join ADWR.

Smith's division at ADEQ had a budget of over \$15 million, with approximately 200 employees. Her responsibilities included ensuring the safety of drinking water of public water systems, developing water quality management plans, establishing water quality standards and responding to emergencies. She also has been a member of the Governor's Drought Task Force, the Governor's Colorado River Water Quality Task Force and the Perchlorate Working Group.

Report Faults USIBWC Commissioner

A U.S. section of the International Boundary and Water Commission statement says a recent State Department report critical of its commissioner is politically motivated. Issued by the State Department's inspector general's office, the 60-page report evaluated Arturo Duran's performance as head of the USIBWC. Duran, who was appointed by President Bush, has been commissioner for 15 months.

The State Department report was especially critical of Duran's personnel actions that it says undermined the operation of the USIBWC. The report states, "Internal management problems have engulfed USIBWC, threatening its essential responsibilities for flood control and water management in the American Southwest."

The report acknowledged that the agency had experienced several years of internal management turmoil when Duran took control of the agency. Also the report was favorably impressed with Duran's outreach activities and acknowledged that his agency contributed to the successful negotiations to resolve Mexico's treaty obligation

to provide Rio Grande water to the United States. Further, the report credits Duran for "helping break a logjam affecting sewage treatment on the California border with Mexico."

Yet the report found sufficient fault to state: "The Department of State bears clear foreign policy oversight of USIBWC. The time has come, however, for stricter Department or other U.S. government oversight of how the commission manages matters related to its personnel."

In response, the commission's statement said the report was mistaken in claiming that the USIBWC was a State Department subdivision when in fact it is an "independent federal commission." It further claimed that the real intent of the report is to exert State Department authority over the commission, thus subverting its 115-year history as an independent agency.

The statement also added, "The USIBWC has taken a proactive and constructive approach to the inspection and has already taken steps to implement some of the report's recommendations."

No AMA for Upper San Pedro Basin

The San Pedro Basin will not be declared an Active Management Area despite the urging of various environmental groups who wanted the designation as a means for preserving the flow of the San Pedro River. Arizona Department of Water Resources Director Herb Guenther determined that the San Pedro situation does not meet the statutory requirements for establishing an AMA outlined in the state's Groundwater Management Act.

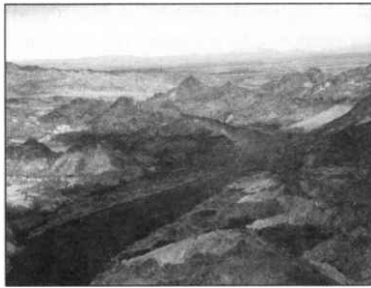
Beginning in Mexico and joining the Gila River at Winkelman, the San Pedro is a river of controversy, its perennial flow supporting stands of cottonwood and willow forests that provide habitat for more than 300 types of birds. Meanwhile groundwater pumpers in the Benson and Sierra Vista area pose a threat to the river's flow. Environmentalists fear for the survival of the river.

Statutory considerations, however, determined Guenther's decision not to es-

Water Quality Concerns Along the Colorado River

ADEQ Checks if Plume is Risk to AZ Water

The Arizona Department of Environmental Quality will conduct a study to determine whether groundwater in Arizona has been contaminated by a plume of hexavalent chromium coming from the Pacific Gas & Electric Topock natural gas compressor near Needles, California. PG&E has agreed to pay for the study that is expected to cost more than \$350,000.



Colorado River
Photo: Bureau of Reclamation

The intent of the study is to examine the groundwater flow on the Arizona side of the Colorado River to determine if the hexavalent chromium plume, also called chromium 6, is migrating under the riverbed and contaminating water supplies in Arizona. Although none has been found in the river

itself, the polluted water could have flowed beneath the river. Also, drinking water wells in the communities of Topock and Golden Shores, Arizona, will be sampled as part of the study.

Recent test results have raised concerns: California regulators announced on Feb. 22 that high levels of chromium 6 have been detected in a monitoring well just 60 feet from the Colorado River. The sample detected 354 parts per billion of total chromium; California's limit is 50 ppb in drinking water. The Colorado River provides drinking water for more than 18 million Southern Californians and 4 million Arizonans.

In response to the test results ADEQ Director Owens wrote a letter to the California Regional Water Quality Control Board on March 14 stating, "The plume of hexavalent chromium may have already moved beneath the Colorado River and may now be contaminating Arizona's groundwater."

Owens wrote that heavy levels of chromium 6 occurring at a depth of 90 to 100 ft. below the surface demonstrates that "the potential threat to Arizona's groundwater and surface water resources from the plume has increased significantly."

Arizona is not alone in its concern about the pollution. Also worried about the plume are Metropolitan Water District of

Southern California and local water agencies. Also, five Indian tribes residing along the Colorado River fear the utility's clean-up plans will dishonor tribal sacred sites.

DOE May Move Toxic Pile From Colorado River

The U.S. Department of Energy announced that its "preferred alternative" for solving the problem of a 12-million-ton pile of radioactive waste located along Colorado River is to move it away from the river banks. DOE had considered other options including leaving the pile on-site, 750 feet from the river, near Moab, Utah, capped with a layer of impermeable clay.

DOE's consideration of an on-site option attracted strong opposition, with western governors, bipartisan members of Congress, various water agencies including the Metropolitan Water District of Southern California, and a number of Lower Colorado River state agencies, including the Arizona Department of Environmental Quality, voicing vigorous objections. The U.S. Environmental Protection Agency also joined the chorus, informing DOE that leaving the waste pile by the river is "environmentally unsatisfactory" and possibly poses a public health hazard.

The toxic pile's proximity to the river raised fears that toxic chemicals will leak into the river, a source of water for about 25 million people including residents of Phoenix, Tucson, Los Angeles and Las Vegas.

According to DOE present leakage does not pose a hazard; the agency reports that the 15,000 gallons of toxic chemicals including ammonia, selenium and chromium now leaking into the river each day are diluted in the drift and flow of the river.

Of concern to many is not just the daily discharge, which could continue for centuries if the pile remains in place, but the potential of a flood scouring the area and washing the toxic pile into the river, with catastrophic results.

If removal does in fact become DOE's final decision, the agency would be taking the more costly option. Energy officials say leaving the pile on-site would cost about \$166 million whereas moving it would cost between \$329 million and \$464 million. Work is not expected to begin until 2007, with an expected completion date of 2012. Getting Congress to approve funding for the project may be a hurdle to overcome.

DOE intends to review all public comment before issuing a final decision, expected early summer.

establish an AMA in the area. He said that not only was there sufficient groundwater in the area to meet future needs, but groundwater pumping was not resulting in land subsidence or fissuring nor was it degrading water quality in the basin; thus the legal criteria for establishing an AMA were not met.

Studies determined that the basin stores between 20 million to 26 million acre-feet of groundwater, with pumping in

the area drawing out more than 9,500 acre feet than is naturally recharged. Although a cone of depression is deepening around Sierra Vista and Fort Huachuca, the state found that not much change has occurred in groundwater levels adjacent to the river.

Some officials say that the request to establish an AMA in the San Pedro basin to help preserve the flow of San Pedro River is asking the GMA do something it was not

intended to do; i.e., provide for sustainable use without adverse environmental consequences. The AMA goal of safe yield — a condition in which the amount of groundwater pumped does not exceed the amount recharged — would not necessarily preserve the flow of the San Pedro. It is possible that the river could diminish in flow even though pumping is equal or less than recharge; therefore the GMA would not be violated.



Guest View

Prescott Valley Reaps Benefits From Public-Private Partnership

This Guest View was a collective project involving Mark Kieren, Prescott Valley utilities contract coordinator; Neil Wadsworth, Prescott Valley utilities division manager; John Bowman, Operations Management International, Inc. Project manager; and Larry Tarkowski, Prescott Valley town manager.

Municipal privatization has long enjoyed its status as a well-known buzzword in governmental circles. After all, outsourcing saves millions in the long haul, all the while capitalizing on a simple division of labor approach that makes sense in today's world.

Leaders within the Town of Prescott Valley have long embraced the concept of outsourcing and have consistently nodded their collective consent in this direction. One matter that further reinforces this concept is the appreciation on the value of the partnership approach in providing service delivery for the community.

"The council has been sensitive to not growing a large municipal bureaucracy — an ideal it has embraced for the last 15 years," said Larry Tarkowski, town manager.

Because the council intentionally chose to remain on the cutting edge of outsourcing, rather than building a municipal water or recharge department, town divisions such as public works and engineering benefit from seeing 90 percent of its workload outsourced.

In the public works department, for example, if these divisions were staffed using the traditional model, there would be close to 200 personnel. Currently, the divisions utilize a staff of 30 — many of whom are involved with contract administration as opposed to direct service. By outsourcing, the town is able to leverage the experiential base wider than what we have currently available. A huge benefit to having that expertise on-site is that a private sector company is usually more agile and innovative because it is driven by profit to stay very competitive, which is an element that typically does not exist with municipally run operations. Outside resources typically embrace new technologies as they emerge in their efforts to produce a high end result.

As part of the privatization process, the town has maintained a contract with Operations Management International, Inc. since 1993 for wastewater services. This contract eventually encompassed the treatment and collection system, followed by the inclusion of the town's first municipal water system. "Therefore, it's been a natural move to keep OMI on board for those services," said Neil Wadsworth, utilities division manager for Prescott Valley.

The town later purchased a private water company and contracted services out for the operating and maintenance for that water system as well. For the upcoming new fiscal year 2005/06, OMI also will be taking over the operation and maintenance of the recharge system, Wadsworth said.

The view from the contract operations side also cites the benefits of working within a partnership. "We have about 150 municipal and industrial clients out there across the United States, and part of our service commitment involves keeping an eye on state and federal regulations," said John Bowman, OMI project manager. OMI staff

work to track the ebb and flow of the industry and ensure a steady hold on compliance levels, he said.

Since 1993, OMI presents an annual report presentation to the town's council that includes effluent treatment costs, on a per unit basis. Even with growth and inflation, costs have gone up but unit costs have actually decreased. Staffing levels also are lower than typically observed for municipal operations. In a survey of comparable municipalities, OMI cites an average staffing level of 1.3 persons performing water services per 1,000 population. OMI's staffing levels, for contract operations, are closer to an average of 0.90 persons per thousand. In Prescott Valley they currently are at 0.49, but expect that number to increase to about 0.58 persons per thousand, starting in July, to meet needs based on growth and the provision of additional services.

In turn, the town provides support to OMI whenever possible, working to ensure the highest quality standards.

If the customers don't receive the high quality standards they've come to expect, staff hears about it. Then, OMI hears about it ... and the town must make those adjustments.

It's important to note that this cooperation gives the town a "bigger bang for the buck," regarding the resources they (OMI) bring to the table. If the town provided all of these water and wastewater services in-house, current resources could be stretched to the limit in terms of manpower and cost. Approaching service delivery within the public-private partnership fashion works and from the operations side, it's a major benefit.

Within the public works industry, survey statistics reveal that 97 percent of government contracts up for renewal in 2004 benefitted from renewal.¹ High renewal rates for government contracts are well above average. Bowman agreed that many governmental agencies are now taking advantage of outside sources. "In the regulatory market it's becoming more difficult for municipalities to provide services in-house. In summary, Bowman added that partnerships also build a sense of place. "We're vested in the community in which we work. My family lives in Prescott Valley. We're part and parcel of Prescott Valley," Bowman said. ■



¹ Source: *Public Works Finance* newsletter March 2005



Legislation and Law

Board Considers Policy for Registrants Acting as Expert Witnesses

AZ law restricts payment of contingency fees to witnesses

The payment of contingency fees to expert witnesses in legal proceedings is a controversial topic, one that concerns those who testify in water-related proceedings. The Arizona Board of Technical Registration is considering what policy, if any, to adopt if one of its registrants accepts a contingency fee when acting as an expert witness.

BTR's mission is to protect the public by setting appropriate registration qualifications for those practicing board-regulated professions and occupations; the board also enforces state statutes affecting its registrants. Whatever policy the BTR adopts will apply only to those professions and occupations the board is set up to regulate: these include geologists, engineers and landscape architects.

(Hydrologists are not registered by BTR, although interest has been expressed at various times that the board regulate the profession or occupation. Hydrology would seem to be an appropriate field for BTR to regulate since it has the potential to affect the safety, health and welfare of the public. Yet there seems not to have been sufficient interest to develop and support the necessary legislation to direct the BTR to develop licensing rules, examinations and other necessary prerequisites to license hydrologists.)

BTR's research of the contingency fee issue included a review of codes adopted by various professional societies. The board found that the codes are either silent on the issue or they include a qualification that such fees are unacceptable if they have the potential to compromise professional judgement.

In preparing to work out its policy, BTR requested that an assistant attorney general review Arizona state laws related to fees for legal matters; specifically whether contingency agreements with expert witnesses are permissible in Arizona. In response, the board was informed that state law considers any contract to pay a witness based on the outcome of litigation to be void and not enforceable.

Further, under current BTR rules, the board does not have the expressed authority to discipline registrants entering into these agreements. In other words, although such contracts are void and unenforceable, members of BTR-regulated professions accepting contingency fees are not necessarily guilty of violating a Board rule or statute and thus subject to BTR discipline. The board is now in the process of deciding whether BTR rules should be modified to enable the board to discipline registrants who accept contingency fees.

In addressing the issue, the BTR is not responding to any particular complaint that a registrant had in fact taken a contingency fee, although concerns have been raised that the issue is becoming

more prominent. In a presentation before the Board's Legislative and Rules Committee, a registrant contesting the use of such fees stated it was his impression it is happening more often than it use to.

If BTR modifies its rules to discipline registrants taking a contingency fee while serving as an expert witness, it could take various courses of action, including a dismissal of the complaint. A range of other possible actions exists, from attaching a letter of concern to a person's record — this is considered a non-disciplinary action — to revoking a registrant's license.

What is more likely, however, is that a consent agreement would be worked out between the board and the registrant, with the registrant agreeing to some kind of disciplinary action. This could include discontinuance, payment of a fine or the cost of the investigation or attendance at a course on ethics or on the board's rules.

Whatever action the BTR takes, whether or not to discipline and what penalty to impose, applies only to professions it regulates. The law, however, applies to all professions and occupations. For example, a hydrologist testifying in a case and accepting a contingency fee is violating the law but would not be subject to BTR disciplinary action since the board does not regulate hydrologists. The contract with the hydrologist, however, would be considered void under the law: this could result in a setback in the courtroom. For example, an opposing lawyer could contest the testimony on the grounds that state law prohibits testimony from individuals accepting a contingency fee; the lawyer could then argue that the testimony is not valid.

BTR's Legislative Rules Committee is reviewing the issue and will make a recommendation for the board to act upon.

Water Policy Dialogue Urges National Water Commission

In February, Tucson hosted the American Water Resources Association's Second National Water Resources Policy Dialogue, an event sponsored by nine federal agencies and 40 state, local, business and non-governmental organizations. Ideas generated by the dialogue are included in letters AWRA recently sent to President Bush, Speaker of the House Tom DeLay, Senate Majority Leader Bill Frist, key members of Congress and governors of the 50 states.

The letters urge the formation of a bipartisan commission to examine critical water issues now facing the nation and to work out strategies for addressing the issues and resolving conflicts.

The letters also mention the national challenges identified by participants in the Tucson dialogue. The challenges include the need for water issues to be addressed in an integrated manner; the need to reconcile the myriad laws, executive orders and Congressional guidance that have created a disjointed, ad-hoc national water policy; the better coordination of the actions of federal, state, tribal, and local governments in dealing with water; the need for scientific

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Publications & On-Line Resources

New Publications Discuss Water Resources on U.S. – Mexico Border

Water Issues on the Arizona – Mexico Border: The Santa Cruz, San Pedro and Colorado Rivers *Terry Sprouse, senior research specialist, Water Resources Research Center, University of Arizona.* This paper examines the issues of water quality and quantity and



Pennington House on U.S.-Mexican Border. Photo: Terry Sprouse

environmental impacts in the Upper Santa Cruz River, the Upper San Pedro River and the Lower Colorado River, the main Arizona-Mexico transborder rivers. The border is an area of increasing populations in need of greater supplies of water.

The Upper Santa Cruz River is comprised chiefly of wastewater from Nogales, Sonora that is treated at the Nogales International Wastewater Treatment Plant in Arizona. Options examined for managing the Mexican effluent include using the water to generate electricity for Nogales, Sonora, and purchase of the Mexican effluent by a water authority in southern Arizona.

The Upper San Pedro River faces the possibility of becoming a dry river bed due to increased pumping of groundwater. The paper examines interest groups that have organized and legal actions taken in the United States and Mexico to protect the

river. As the United States has appropriated more of the Lower Colorado River, water flows into Mexico have been proportionally reduced. Although the flows meet treaty obligations, riparian habitat and species are threatened. The paper examines the complex issues and management alternatives related to the Colorado River.

This WRRC issue paper is available at the center's web site: <http://www.cals.arizona.edu/azwater/>

Water Resources Management on the U.S.-Mexico Border *Good Neighbor Environmental Board*

The Good Neighbor Environmental Board, an independent advisory committee managed by the U.S. Environmental Protection Agency, recently published this report. According to the report limited supplies, pockets of poverty, a combination of jurisdictional gaps and overlaps and many other challenging issues contribute to the difficulty of managing water resources in the region. Suggested actions to improve the situation include: clarify responsibilities of U.S.-Mexico border-region institutions responsible for water management; develop and sign formal U.S.-Mexico water resources data agreements; and implement a five-year border integrated water resources planning process. The report is available at www.epa.gov/ocem/gneb or by calling 1-800-490-9198 and requesting the document, EPA 130

BECCnet, on-line service to discuss border issues

BECCnet is an online resource for discussions about the activities of the Border Environment Cooperation Commission, North American Development Bank and other border environmental institutions. Initiated ten years ago, BECCnet has become a resource that has encouraged expectations among stakeholders on both sides of the border about openness in decision making. Subscribers are able to post messages or queries in English or Spanish about border environmental institutions or topics.

BECCnet is maintained by the University of Arizona's Udall Center for Studies in Public Policy. Additional information including subscription information available at <http://udallcenter.arizona.edu>

Western Waters Digital Library

This project, a cooperative venture involving the University of Arizona, Arizona State University and other western universities, is developing digital collections on four river basins: the Colorado, Columbia, Rio Grande and Platte. The project goal is to gather various kinds of information from the participating universities — printed text, photographs, maps, manuscripts, government reports, oral histories, legal transcripts, water project records, personal papers etc. — into one searchable web site. A focus is on the interplay between rivers and human development throughout the rivers' watersheds, with an emphasis on social, geographic, economic, legal and historical developments. To access this resource go to www.westernwaters.org

Water Dialogue...continued from page 7

capabilities and information technologies to be focused on supporting water policy decision makers; and the need to educate public officials and the public about the extent and complexity of water challenges.

The purpose of the dialogue was to serve as an open forum for discussing water issues with varied water resource interests participating: policy makers, scientists, and researchers from all

levels of government including tribal, the academic community, industry, environmental groups, other NGOs and the general public. The dialogue included over 250 of the nation's water resources experts. To see the final program, text of letter, and dialogue summary check <http://www.awra.org/meetings/Tucson2005/>

The first dialogue was conducted in Washington D.C. in September 2002.



Special Projects

Research Looks at Non-Treatment Options to Meet New Arsenic Standards

EPA's lowering of the arsenic drinking water standard from 50 ppb to 10 ppb has significant consequences for Arizona. With the old standard of 50 ppb in effect, 0.1 percent of the Arizona population served by community water suppliers exceeded the limit. Reducing the standard to 10 ppb results in 13 percent of the population served exceeding the new standard, with much of this population located in rural areas.

Treatment or non-treatment strategies are the two broad classes of options available to Arizona water utility operators as they make plans to meet EPA's new arsenic drinking water standard. Finding that insufficient information is available to operators about non-treatment strategies, University of Arizona researchers are evaluating the hydrogeologic applicability and economic cost of such methods. The information they gather will inform decisions made by utility operators about the best treatment or non-treatment option to use.

The researchers are especially concerned with the plight of small water providers. Lacking extensive resources, small utilities bear a greater burden in attempting to meet the Jan. 23, 2006 compliance deadline. Their burden might be lessened if they were aware of non-treatment strategies and able to utilize these methods rather than rely on expensive wellhead treatment (chemical) strategies.

(The Arizona Department of Environmental Quality's Arsenic Master Plan, developed to assist Arizona water systems, recognizes non-treatment options but does not evaluate them. It suggests that especially for small providers non-treatment may be preferable to treatment options. Actual cost estimates are not provided.)

A preliminary research task is determining the feasibility of particular methods. A review of treatment methods focuses on basic water quality information, whereas non-treatment options require detailed hydrogeologic characterization to define aquifer conditions, sources of arsenic and the vertical and horizontal distribution of arsenic within the aquifer.

The research project has four main objects:

(1) Select non-treatment options for evaluation. Researchers will consult with ADEQ to select non-treatment methods best suited for the hydrology of Arizona. The simplest non-treatment methods include modifying pumping schedules to maximize pumping from low-arsenic wells or blending water from other low-arsenic sources. More costly methods include rehabilitating existing wells to improve yields from low-arsenic zones, modifying existing wells to seal off high-arsenic aquifer zones and installing properly located and designed replacement wells.

(2) Assess the hydrogeological applicability of non-treatment options. After selecting suitable non-treatment options the researchers will assess the necessary hydrogeologic conditions required for each method. This information will be considered along with existing information about arsenic distribution and hydrogeology to de-

termine regions where non-treatment methods can be implemented.

(3) Assess cost of non-treatment options. The identified set of non-treatment options will then be evaluated for implementation cost, with cost estimates from contractors or previous field implementations used. An option's cost effectiveness will be assessed in reference to various characteristics of a potential water supplier such as number of wells with high-levels of arsenic and number of household connections.

(4) Determine the set of cost-effective treatment or non-treatment options. Information generated in (2) and (3) will be

used to develop a screening tool process to enable individual water providers to evaluate the cost effectiveness of non-treatment options compared with treatment options. By entering basic information about their water supply (geologic/hydrologic location, number of wells, number of households supplied, etc.), water providers will be able to identify methods capable of achieving compliance and evaluate their costs compared with treatment options.

If the screening shows that a non-treatment method has a good potential to work in a particular situation, the water provider would still need to conduct a detailed hydrogeologic investigation as a prerequisite for implementing a non-treatment method.

Research results will be provided to ADEQ for possible incorporation into the state's Arsenic Master Plan; water providers will then have access to the information along with a greater number of options to consider.

The two-year project is in its first year. Steven Stewart and James Hogan, both from the UA Department of Hydrology and Water Resources, are principal investigators. Graduate student Jacob Davis is participating in the project during its first year. For additional information contact Stewart at ss Stewart@hwr.arizona.edu

The research is funded by the Technology and Research Initiative Fund. TRIF resulted from a November 2000 voter approved increase in the state sales tax to support education. A portion of the fund goes to the state's university system to invest in technology and research-based initiatives. ■



The University of Arizona's Department of Hydrology and Water Resources presented its 15th annual El Dia del Agua Student Research Symposium on March 3. Billed "for the students" and "by the students," the event is an opportunity for hydrology students to present research projects. Above is the poster session where project information was displayed. The research discussed in Special Projects was included as a poster presentation. Photo: Joe Gelt



Announcements

Funding for Riparian Projects

The Arizona Water Protection Fund, a program administered through the Arizona Department of Environmental Quality, supports projects that maintain, enhance and restore river and riparian resources throughout Arizona, including projects that benefit fish and wildlife. Approximately \$1.5 million in grant awards for the 2006 grant cycle is anticipated. Only applications will be accepted for capital projects that implement on-the-ground measures that achieve program goals. Additional information as well as the Grant Application Manual is available at the AWPf web site: <http://www.awpf.state.az.us> Applications are due by June 15.

Conference on Colorado River Hard Times

Titled "Hard Times on the Colorado River: Drought, Growth and the Future of the Compact," the University of Colorado's Natural Resources Law Center's 26th annual conference will focus on the emerging water supply crisis on the river and the legal, policy and management issues affecting it. With featured speakers and panel sessions, the conference will address topics concerning the Law of the River, the ability of the system to meet delivery and hydropower obligations, potential impacts of shortages to water users and the environment and solutions for future management. The conference will be in Boulder, June 8-10. Check the conference web site for additional information and to register: www.colorado.edu/law/summerconference/

New Mexico Symposium Calls for Papers

The New Mexico Water Resources Research Institute has issued a call for papers for a symposium it is hosting Aug. 16 in Socorro, New Mexico. Titled "Advances in Hydrology: Methods and Instruments," the symposium will address a variety of subjects including water quality and security, geomorphology and water management and policy. Abstracts for presentations and/or posters not exceeding 250 words and concerning water research relevant to New Mexico must be submitted by July 15. Abstracts must be submitted online at <http://wrri.nmsu.edu> That site will also include updated information about the event. For more information, call Catherine Ortega Klett at 505-646-1195, or email her at coklett@wrri.nmsu.edu.

Watershed Management Conference Scheduled

The 2005 Watershed Management Conference, "Managing Watersheds for Human and Natural Impacts: Engineering, Ecological and Economic Challenges" will be held in Williamsburg, Virginia on July 19-22. Engineers, hydrologists, biologists, ecologists, attorneys and public officials are invited to attend. Conference topics include state-of-the-art computer modeling, field monitoring, watershed science and government policy and regulation. Issues such as the effects of fire and post-fire mitigation on watershed hydrology

and managing watersheds for control of ecological impacts will be tackled. For more information check <http://www.asce.org/conferences/watershedmanagement2005/>

Arizona Water Quality Monitoring Council Forming

Efforts are underway to establish an Arizona Water Quality Monitoring Council. Its goals include: improve water quality monitoring networks across the state by generating greater cooperation among monitoring groups, researchers and agencies; share data, experiences, and resources among these groups; implement and promote more citizen-based monitoring projects; build comparability among water quality methods and data; educate each other as well as the public; and improve water quality across the state of Arizona. Those now conducting or wanting to conduct water quality monitoring in the state are invited to participate. All levels of interest and experience welcomed. For more information, contact Robert Emanuel at 520-621-1268 or Mario Castaneda at 620-286-8663 or check <http://www.cals.arizona.edu/watershedsteward/>

CAP Offers Water Research Award

CAP offers two annual awards for outstanding water research, with \$1000 going to the first place winner and \$500 to the second place winner. Graduate and undergraduate students at any Arizona college or university are eligible to participate. Research submitted for this award should focus specifically on water issues that affect Central and Southern Arizona and the Colorado River. Papers can focus on legal, economic, political, environmental, or water management issues, as well as any other issue that might be of interest to CAP or Arizona water users. Papers should represent the student's original, unpublished work. Students should submit the entry form, the complete paper and a one page abstract electronically to Vicky Campo at vcampo@cap-az.com or apply online. Deadline is June 1. For more information check <http://www.cap-az.com/>

NAU Hosts Tri-University Water Conference

Northern Arizona University's Center for Sustainable Environments is hosting a Tri-University Water Conference, Aug. 3-5, in conjunction with the 2005 Southwest Sustainability Expo. The conference will address issues of Arizona water sustainability from several perspectives, including climate variability and change, water management, ecosystems, agricultural and resource economics, urban growth and water conservation. The conference also will feature tours of water related sites and facilities in Northern Arizona, such as Fossil Creek and Hopi Springs. More information will be available on the NAU Center for Sustainable Environments website at <http://environment.nau.edu/>



Public Policy Review

by Sharon Megdal

WRRC's Conference Considers What it Takes to Fix an Ecosystem



On April 6 the Water Resources Research Center held its annual conference. Titled "Water and the Environment: The Role of Ecosystem Restoration," the conference provided a forum for learning about environmental enhancement in Arizona. Information, experiences and perspectives were shared, and restoration efforts were "showcased."

Whatever word we use — restore, preserve, maintain or enhance — such projects are designed to improve an environment over and above what would have existed if actions had not been undertaken. But how do we decide which actions to undertake?

Opening keynote speaker Bill Dawson of the U.S. Army Corps of Engineers commented that cost-benefits analyses should not be the sole consideration of environmental restoration efforts. He also noted that it does not matter how we got to the degraded situation, but rather it is important to figure out how to fix it.

Fixing water quality problems is the focus of many restoration efforts nationally. In his overview of restoration projects, Cliff Dahm of the University of New Mexico documented the increase over the last ten to 15 years in river restoration projects in Arizona, the Southwest and indeed throughout the nation. By far, water quality management and riparian management were the two most prevalent purposes of these projects. Measuring the success of restoration efforts through monitoring is important. Julie Stromberg of Arizona State University focused on the question of assessing success through measuring ecosystem improvement and improved system resilience.

A public perception of success, however, also is important. The projects that possibly are most likely to touch the greatest number of people are along the Salt River in Maricopa County. After being rejected by voters in the 1980s, habitat improvement along the Salt River - Rio Salado has become a focal point of multiple jurisdictions and Indian Nations. Improvements are varied. Karen Williams of Phoenix spoke of the importance of restroom facilities, benches, and staging areas for teachers. She was hopeful that benefits would spillover beyond the banks to what are distressed areas of Phoenix.

In "The Cadillac Desert," Mark Reisner spoke of these distressed areas: "Phoenix owes its existence to [the Salt River], but even so it doesn't seem to hold the Salt in high esteem. On both banks, the floodplain is encroached by industrial parks, trailer parks, RV parks, but no real parks. The flood channel itself has been developed to a degree, playing host to establishments which are, by nature, transient: topless bottomless joints, chop shops, cock-fighting emporia. Paris built its great cathedral by its river; Florence its palaces or art; Phoenix seems to have decided that its river is the

proper place to relegate its sin."

Efforts are underway to remedy the remnants of the sad and dismal situation described by Reisner. These efforts, including Audubon Arizona's new nature center at River and Central Avenue, have the potential to improve more than just the non-human environment.

Participants were upbeat and the event's atmosphere was positive despite the general awareness that challenges associated with restoration efforts are substantial. A significant factor for all of these projects is water; water is needed to sustain environmental enhancement efforts. Questions remain about the water supplies or sources necessary to sustain some of these projects along with the long-term costs of water. My own study of environmental restoration efforts in Pima and Maricopa counties provided information on the substantial water requirements and costs of some of the projects studied.

To act early to develop partnerships and involve interested parties was underscored. These partnerships can take many different forms and often involve the private and public sectors. The need for monitoring and multidisciplinary research was clear, both at the front-end of projects as well as after projects are completed. The need for communication at many levels was apparent. Whether relating the reasons for spending millions of dollars on the Lower Colorado River Multispecies Conservation Program or for putting up elk fencing, communicating with the general public and stakeholders is always important. Sometimes the information may elicit an unexpected response. This occurred in Pima County when area residents did not support moving forward with an ecosystem restoration project conceptualized for the Agua Caliente Park.

The need for funding was emphasized. Restoration efforts often take many years and involve significant investments, especially when land acquisition is involved. Partnerships are needed to get things done. The last session of the day, which focused on funding, made it clear that parties will have to be more resourceful to assemble the necessary financial, water and other resources.

Finally, I would be remiss if I did not mention the discussion about the use of the legal system to effect environmental policy. Attorneys Joy Herr-Cardillo of the Center for Law in the Public Interest and Tom McCann of Central Arizona Project agreed that the courts rarely "make" policy. But we all know the threat of lawsuits or actual lawsuits can influence actions taken by involved parties.

The presentations — too numerous to cover here — were informative and attractive, and we have obtained permission to post most of them on the Water Resources Research Center's web site: www.cals.arizona.edu/AZWATER. They are linked to a final agenda showing the speakers and presentation titles.

I thank all of the speakers, moderators and attendees for participating in the conference! 🏡

UA Water Sustainability Program Announces Water Research Awards

The University of Arizona's Water Sustainability Program recently announced projects funded for FY 2006. Eight projects were selected out of 53 proposals submitted to the competitive grants program. WSP has \$363,000 to fund new projects; along with these new projects, WSP is supporting 17 continuing projects.

(The source of WSP funding was a November 2000 voter approved increase in the state sales tax to support education. A portion of the amount went to the state's university system, to invest in technology and research-based initiatives. UA uses some of this funding for the WSP competitive grants program to support water research.)

Following is the list of new WSP projects:

Novel Desalination Technology for Potable Water Production. James C. Baygents, Dept. of Chemical & Environmental Engineering, College of Engineering. Award: \$49,981.

Screening Tools to Assess the Feasibility of Monitored Attenuation for Remediation of Chlorinated-solvent Contaminated Groundwater. Mark Brusseau, Dept. of Soil Water and Environmental Sciences, College of Agriculture and Life Sciences/ Dept. of Hydrology and Water Resources; Jim Field, Dept. of Chemical and Environmental Engineering, College of Engineering. Award: \$36,424.

Arizona Project Wet Evaluation: Examining Impact and Developing Water Education Assessment Tools for Students. Jerome D'Agostino, Dept. of Educational Psychology, College of Education; Kerry Schwartz, Water Resources Research Center, College of Agriculture and Life Sciences. Award: \$50,000.

Integrated Surface and Subsurface Response of Alluvial Basins to Ephemeral Stream Channel Recharge and Urban-focused Recharge. Jon D. Pelletier, Dept. of Geosciences, College of Science; Ty P. A. Ferré, Dept. of Hydrology and Water Resources, College


of Engineering. Award: \$58,570 per year for two years.

Polybrominated Diphenyl Ethers in Biosolids: Assessment of Relative Risk after Land Application. David Quanrud, Arid Lands Studies, Jon Chorover, Soil, Water & Environmental Science, Ornela Selmin, Veterinary Science & Microbiology, College of Agriculture and Life Sciences; Eduardo Sáez, Chemical & Environmental Engineering, College of Engineering; Cynthia Adamson, Sarver Heart Center, College of Medicine. Award: \$55,000 per year for three years.

Autotrophic Denitrification for the Treatment of Drinking Water. Reyes Sierra, Jim A. Field, Dept. of Chemical and Environmental Engineering, College of Engineering. Award: \$34,833 per year for two years

The Value of Binational Effluent and Sustainable Watershed Management in the Upper Santa Cruz Basin. Terry Sprouse, Water Resources Research Center, George Frisvold, Dept. of Agricultural and Resource Economics, College of Agriculture and Life Sciences. Award: \$63,707.

Promoting the Adoption of Subsurface Drip Irrigation by Arizona's Farmers. Thomas L. Thompson, Dept. of Soil, Water and Environmental Science, Edward Martin, Dept. of Agricultural and Biosystems Engineering, Patrick Clay, Maricopa County Cooperative Extension, Mary Olsen, Dept. of Plant Pathology, Russell Tronstad, Dept. of Agricultural and Resource Economics, James Walworth, Dept. of Soil, Water, and Environmental Science, College of Agriculture and Life Sciences. Award: \$20,358 per year for three years.

For further information about the above projects contact: Jackie Moxley, Water Sustainability Program Coordinator, University of Arizona, Water Resources Research Center; phone: 520-792-9591 X17, email: jmoxley@ag.arizona.edu 



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