



## *Sustainable Water for All: Lessons in Hydrophilanthropy*

By *Stephan Elizander Przybylowicz*  
WRRC Graduate Assistant Outreach

*"The next time you see an ad for a water charity featuring a cute, dark-skinned child and a deep-voiced announcer who says, 'Last year, we drilled 50 wells in Terra Buena and one was in Rosa's village,' you need to ask, 'How many of those wells are still working?'"*

—Michael Campana, hydrophilanthropy pioneer

**T**he field of hydrophilanthropy has been around for decades, although the term is fairly new. Hydrophilanthropy means different things to different people, depending on which end of the deal they are on. David Kreamer (who coined the term) promotes "a flexible, open minded approach to the description of hydrophilanthropy and its attributes, a definition that includes many diverse activities and practitioners who advance the sustainability of clean water in the world."

Some may see hydrophilanthropists as volunteers traveling across the world to provide clean water for poor underdeveloped countries. Alternatively, they may be seen as a group of outsiders coming into a community with empty promises of progress, while the community is left with the vestiges of failed projects and crushed dreams. The reality is that both of these viewpoints are historically true, but hydrophilanthropists are beginning to take a closer look at the way things have been done in the past to promote sustainable water use for the future.

According to a recent United Nations report, approximately half of the world's population has inadequate sanitation. SAIWI (a student water group from UNLV) states that "Water, health, and poverty are inextricably linked." This means that providing clean water to people can ultimately help them escape the cycle of poverty and reduce illness. Furthermore, studies have shown that in places without readily accessible water, women and girls can spend up to eight hours per day collecting it. This can lead to severe health problems and take them away from education or performing other household or business activities.

A year ago, the UA chapter of Engineers without Borders was finishing up a water filtration project in Ghana. This year, the team is working in Mali, West Africa, on a project to increase a community's potable water supply. The people of Mandoli, Mali, have a water pump from a previous hydrophilanthropy organization, but it has broken and been useless since. Mandoli lies in a dry area bordering the Saharan desert and has a 9-month dry season, so having enough food and water is always a challenge. In addition to fixing the local water pump, the UA-EWB group is also working on implementing various rainwater harvesting tech-



*Woman and children carrying water in Mandoli, Mali. Photo: UA chapter of Engineers without Borders.*

niques in the region in order to increase the amount of water available. To ensure sustainability, they are using a multi-pronged approach that includes (1) developing and delivering educational resources focusing on issues of water, sanitation, and health specific to the community; (2) improving the quality of existing water sources for drinking purposes; and (3) developing sustainable alternatives to increasing water supply.

There are several pitfalls that may cause a project to fail. Short-term visits may provide excellent student experience, but leave the community with unfinished technology or little education on how to use it effectively. Lack of coordination with local organizations may lead to diminished upkeep once the original volunteers have left. New water technology is useless if it breaks down and no one has the knowledge or resources to fix it. Also, the donation of free labor and materials may lead to a greedy atmosphere, where community members expect everything to be given to them without any work on their part.

On the flip side, successful projects tend to share some of these five important characteristics:

1. *Local Partnerships:* Partnerships with local communities and established organizations help ensure timely completion of the project and sustainability after the visiting group has left. Fund-matching by local governments also helps ensure the project will be maintained.
2. *Community Involvement:* The local community should be

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## News Briefs

### Sharon Megdal Named Distinguished Outreach Faculty Professor

WRRC Director Sharon Megdal has received the Distinguished Outreach Faculty Professor award, which recognizes outstanding faculty members whose scholarship-based outreach to the state, nation, and the world has demonstrated sustained excellence in the University of Arizona's outreach mission. Through her work with the UA Water Sustainability Program, the Central Arizona Water Conservation District Board of Directors, Governor's Blue Ribbon Panel on Water Sustainability, and Arizona-Israeli-Palestinian Water Management and Policy initiatives, Dr. Megdal has become known and respected for her extraordinary communication and consensus-building skills. Her ability to translate complicated policy issues to a diverse group of policy makers, academics, activists, and interest groups helps to forge both local and global solutions to the exceedingly complex water issues facing Arizona and the world. 🏡

### New Residential Water Reuse System Does Not Require Permit!

There is a new small-scale water reuse system that the Arizona Department of Environmental Quality (ADEQ) has determined does not require regulation by the department. Called AQUUS, the system reuses the water that goes down your sink to flush your toilet, saving fresh water for other purposes like drinking and bathing. This means condominium owners and others who want to use their graywater, but do not have a garden to water, can conserve water through indoor reuse. The AQUUS system by Sloan Valve Company was named a 2010 Top 10 Green Building Products award winner by Sustainable Industries magazine. It also will earn a building rating points in the Leadership in Energy and Environmental Design (LEED) rating system and certification as environmentally friendly. The system currently costs \$375 directly from the manufacturer and collects 10–20 gallons of water daily for an annual average water savings of about 5,000 gallons for a two-person household. 🏡

### Water Settlements Approved for Arizona Tribes

Two Arizona tribes have approved water settlements in the past month.

Joe Shirley, president of the Navajo Nation, has signed an agreement that gives the tribe 31,000 acre-feet of water a year from the Colorado River Basin, any unclaimed flows from the Little Colorado River, and nearly unlimited access to the groundwater found in the two aquifers beneath the reservation. Critics feel that the tribe should not waive future water claims and should have demanded more, but Shirley has confidence in the negotiated deal. The settlement still needs to be approved by the Hopi Tribe, the State of Arizona, and Congress. Then, plans need to be put into place for funding legislation and implementation, so the final deal may still be years away.

On the other end of this cycle, the Senate has approved water settlements with a group of four tribes, including Arizona's White Mountain Apache. This process has been pending, in some cases, for decades. The combined settlement totals \$1 billion, for use towards safe drinking water systems and irrigation improvements. 🏡

### Water Events Calendar!

The WRRC is now hosting a web calendar featuring water-related events at the University of Arizona, the greater Southwest, and relevant national events. Anything from an environmental brown-bag lecture to a major multi-state hydrological conference

can be included. The calendar can be found through the WRRC homepage at <http://ag.arizona.edu/azwater/>. Simply scroll down the "WRRC Features" section on left-hand side and click on the "Water Events Calendar" icon. Faculty, staff, researchers, students, and community members are all welcome to submit events to be included on the calendar. Event notices should be sent to [wrrc@cals.arizona.edu](mailto:wrrc@cals.arizona.edu) and should include the name of the sponsoring organization, title, date(s), a short description, and contact information. A data form to submit events will soon be available on the WRRC website. 🏡

### Central Arizona Project 2010 Board Election

In the recent board election for the Central Arizona Project, Tim Bray and Mark Lewis will continue their service. Newcomers include Frank Fairbanks, the former Phoenix city manager, Jim Holway, a former state water regulator and head of a land and water conservation campaign, and Cynthia Moulton, a retired registered nurse and library volunteer. Members of the Board of Directors are popularly elected from CAP's three-county service area including Maricopa, Pima, and Pinal counties and serve staggered six-year terms. The Board is responsible for establishing water policy for the Central Arizona Water Conservation District and usually meets twice a month. 🏡



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## Blue Ribbon Panel Finishes Work

by Chuck Graf, Senior Hydrologist, Water Quality Division, ADEQ

The sound of the last keystroke to the Final Report of the Governor's Blue Ribbon Panel on Water Sustainability has faded away. Governor Jan Brewer has been handed the report—on time—meeting the target date of November 30, 2010. A collective sigh of relief has risen from the many participants who contributed hours and ideas to the effort. Now, only a multitude of recommendations remain, queued for implementation.

In 2009, Governor Brewer announced the formation of the Blue Ribbon Panel to underscore water conservation and recycling as a priority to improve water sustainability and increase its visibility in Arizona. The Panel, jointly chaired by Ben Grumbles, ADEQ Director, Herb Guenther, ADWR Director, and Kris Mayes, Arizona Corporation Commission Chairman, held its first meeting on January 8, 2010. Forty members representing diverse water interests in Arizona—large and small cities, counties, agriculture, industry, Indian Tribes, environmental interests, Arizona universities, legislative leaders, and other experts in Arizona water issues—were appointed to the Panel.

The Panel set out its purpose as advancing water sustainability in Arizona by increasing reuse, recycling, and conservation to protect Arizona's water supplies and natural environment. In pursuit of this purpose, Panel members agreed to provide recommendations on statute, rule, and policy changes that, by the year 2020 in Arizona, would significantly

1. Increase the volume of reclaimed water reused for beneficial purposes in place of raw or potable water,
2. Advance water conservation, increase the efficiency of water use by existing users, and increase the use of recycled water for beneficial purposes in place of raw or potable water,
3. Reduce the amount of energy needed to produce, deliver, treat, and reclaim and recycle water by the municipal, industrial, and agricultural sectors,
4. Reduce the amount of water required to produce and provide energy by Arizona power generators, and
5. Increase public awareness and acceptance of reclaimed and recycled water

uses and the need to work toward water sustainability.

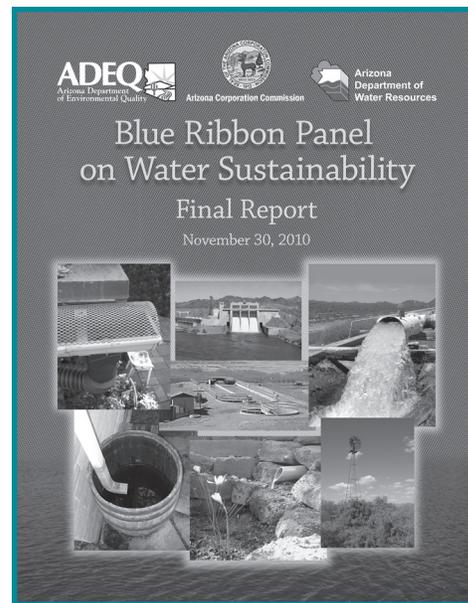
Five working groups were formed, chaired by Panel members and open to the public to facilitate discussion of issues and involve the broadest spectrum of stakeholders and technical expertise. The working groups were created to explore

- public perceptions related to reclaimed water reuse quality,
- regulatory and policy changes to further promote reuse and recycling,
- reclaimed water infrastructure and retrofit best practices,
- conservation/efficiency and energy/water nexus issues, and
- economic and funding opportunities, including both public and private mechanisms.

The five working groups were chaired by, respectively, Kathleen Chavez, Water Policy Manager, Pima County Regional Wastewater Reclamation; Ron Doba, President, Arizona WaterReuse Association; Guy Carpenter, Board of Directors, National WaterReuse Association; Steve Olsen, Executive Director, Arizona Municipal Water Users Association; and David Snider, Supervisor, Pinal County.

The chairs and working group participants accomplished a stunning amount of work in the few intervening months. Cumulatively, 58 working group meetings were held, involving some 320 individuals. The working groups brought forward for Panel consideration 40 separate issues. The Panel prioritized these to 26 issues and directed the applicable working groups to write "white papers" analyzing the issues and provide recommendations based on the analyses. The 26 issues addressed public perception, public education, research needs, regulatory impediments, efficient use of water supplies, expanded use of rainwater and stormwater, the interface between water and energy, funding and incentives, and more.

A summary of each white paper was prepared. The Panel reviewed the white papers and summaries and consolidated them into 18 sets of recommendations in five categories: education/outreach, standards, infor-



mation development and research agenda, regulatory improvements, and incentives. The 18 sets of recommendations actually encompass a total of 63 separate sub-recommendations. All of these now move forward for consideration by the Governor, the Legislature, the Arizona Corporation Commission, ADEQ, and ADWR. A large proportion of the recommendations involve implementation by ADEQ and ADWR, which will challenge the two agencies in light of budget cuts that have reduced staff levels and program capabilities.

Although the Final Report contains too many recommendations to summarize, several recommendations involving data collection and management stand out because they crosscut all three agencies. Accurate information is essential to promoting a common understanding of Arizona's water supplies and the extent to which water sustainability is being achieved. Development of rational policies and regulations that encourage use of recycled water while protecting public health and safety and fostering public confidence depends on appropriate, timely, and accurate data.

Currently, most generators and end users of reclaimed water submit data manually. This process is time consuming and often involves more than one permit or application. Data may be submitted in a report to one agency and the same data or data in a slightly different form may be required in

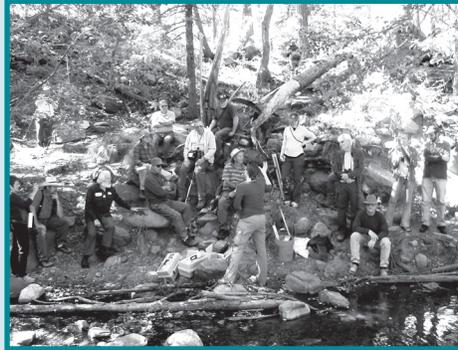
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# A Snapshot of Prog

## Master Watershed Steward Program

The Master Watershed Steward (MWS) program has provided education and training related to local watershed issues to communities throughout Arizona since 2003, with the goal of engaging citizens to help restore and protect their land and water resources. Recently, MWS was awarded funding by the Arizona Department of Environmental Quality (ADEQ) to support the educational needs of community members in specific, targeted watersheds that have nonpoint source pollution water quality impairments. Our goal is to increase the knowledge level of interested community members and train them to become stewards and informed voices of action in their communities.

Currently, ADEQ has identified six priority watersheds throughout the state to receive funding to develop Watershed Implementation Plans that will ultimately identify and prioritize water quality improvement projects critical to restoring water quality in these areas. The WRRC plays a unique role in supporting this effort, as MWS and NEMO are both key resource providers in this process. MWS partners with grass-



*Participants in the Master Watershed Steward Program in an outdoor workshop.*

roots organizations (aka "watershed groups") in these watersheds to identify educational needs and develop opportunities that are of interest to group members. Through this process MWS utilizes faculty expertise at the University of Arizona to develop classes and training sessions that help people understand the physical processes impacting their watershed and what actions can be taken to create healthy watersheds.

MWS courses cover a variety of topics including geology, hydrology, water quality, riparian ecology, forest health, climate, and GIS/GPS mapping, and include several field trips to see first-hand how land use changes and behaviors affect the watershed. These topics provide participants, known as stewards, with an understanding of how they can conserve water on the land to reduce pollution, including sediment, bacteria and nutrients, from entering a stream. In addition, stewards are also trained to effectively communicate watershed issues and explain the importance of changing pollution-causing behaviors to visitors and other community members, reaching out to over 6,000 Arizonans each year. Stewards use this knowledge as volunteers with local watershed groups and also as concerned individuals, caring for their own property. Together, these on-the-ground actions help conserve water, reduce pollution, and create healthy watersheds. MWS is investing in Arizona's environment and communities by empowering individuals to care for their watersheds. 🏡

## Conserve to Enhance

Demands for water are growing in almost all sectors. Meeting environmental water needs and consumer demands requires innovative strategies. But in the absence of state or local policy changes, securing additional water for the environment requires raising funds to purchase water.

### *Conserve Water, Enhance the Environment*

One study has shown that people are more likely to participate in water conservation programs that directly address environmental concerns, but purchasing water for environmental flows can be costly. Making more efficient use of various types of water can extend available supplies. For example, rain water harvesting can replace potable (i.e., drinking) water as the water source for outdoor landscaping.

With this in mind, The University of Arizona Water Resources Research Center (WRRC), The Sonoran Institute, and Watershed Management Group developed the Tucson Conserve to Enhance program to help the community connect water conservation to environmental benefits.

This innovative program offers municipal water customers the option of voluntarily



*Santa Cruz River.*

donating the money they save through water conservation to a fund that obtains water supplies for local enhancement projects. Participants can conserve water at their homes or businesses and then track and donate the money saved from their water bill to benefit local riparian ecosystems.

### *Piloting the Concept*

The Tucson Conserve to Enhance pilot program will begin January 2011. Applications for pilot participants are being accepted between October 22 and January 7. Forty-five partici-

pants will receive a subsidy to install water harvesting features at their homes, if they agree to donate money saved to the Conserve to Enhance fund.

To ensure the success of Conserve to Enhance in any community, WRRC researchers are evaluating this and other pilot programs. As variations on the original concept emerge, we are creating a template of options that local partners can draw from for programs in other areas. The WRRC is also tracking participation in pilot programs to gauge to what extent connecting water users with environmental enhancement will succeed in increasing conservation activities.

This program concept applies a novel approach to an emerging problem, engaging individual water users in voluntary action toward a more sustainable water future where the environment is "at the table" as a water user.

To learn more, visit the WRRC's Conserve to Enhance website: <http://www.cals.arizona.edu/azwater/conserve2enhance.html>

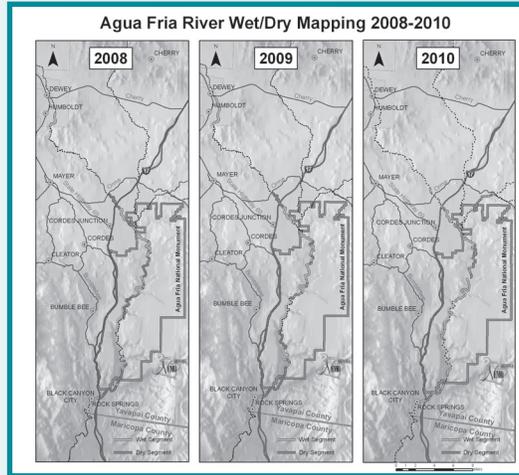
To learn about the Tucson pilot program, visit: <http://www.watershedmg.org/c2e>. 🏡

# grams at the WRRC

## NEMO Wet/Dry Mapping

In response to community interest in developing a volunteer river monitoring program, Arizona NEMO (Nonpoint Education for Municipal Officials) has created a mapping protocol and GIS data management and processing methodology to record the change in perennial reaches in Arizona rivers. Built on a Nature Conservancy and Bureau of Land Management volunteer monitoring program first started in the San Pedro Riparian National Conservation Area, this outreach and education program measures the length of perennial flow in the San Pedro River. NEMO formalized the volunteer training program and is expanding the activity with community groups across Arizona.

The main objective of the monitoring program is to create a map that shows where water is present, and where it is not, in the driest time of the year immediately prior to the monsoon rains of summer. By mapping during the 'dry' season, information about river base-flow and the interrelationship between surface



Source: [www.ArizonaNEMO.org](http://www.ArizonaNEMO.org).

and groundwater can be documented and better understood.

The goal of the annual monitoring is to create a long-term record of changes in river flow: while the record of any single year is interesting, it is the record of multiple years that may

show what is really happening to the flow in the river. In addition, the goal of Wet/Dry is to build community participation, provide outreach education on the importance of long-term monitoring of our natural environment, and foster understanding of the responsibility for the health of Arizona watersheds. Global Positioning System (GPS) technology is used to record where the water starts and stops, and Geographic Information System (GIS) technology is used to produce the final maps. Re-mapping the river each year at the same time can provide valuable data on long-term trends and changes to base-flows.

After contributing to the expansion of the Wet/Dry mapping of the San Pedro River from 50 miles to a total of 134 miles during the June 2007 mapping effort, Arizona NEMO then initiated a mapping program on the Agua Fria River in June 2008. For the first year, 34 volunteers on foot and horseback mapped roughly 24 miles of the 82-mile long Agua Fria River that flows through the rugged Agua Fria National Monument.

## Arizona Project WET Program

Today's students represent the first generations who have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. Some scholars think that these students think and process information fundamentally differently from their predecessors. Arizona Project WET (APW) meets the needs of these students by providing innovative water education programs that infuse twenty-first century learning techniques, communication, and collaborative learning skills in classroom instruction.

Workshops model the inquiry process, presenting participants with a focus question that drives investigation and learning. This process develops problem solving and critical thinking skills in participants as they grapple with locally and regionally relevant content. The workshops employ digital responders, or "clickers" to increase student engagement and achievement.

The fact that American teenagers currently rank 25th in math and 21st in science relative to their international peers has focused national attention on the need to develop Science, Technology, Engineering and Math (STEM) subject area curricula. APW's new School Water Audit Program (SWAP) answers this need. It is a proj-



SWAP students measuring. Photo: Candice Rupprecht.

ect-based action curriculum in which students actually audit a school's water use and make data-based recommendations for conservation.

Students collect their own data by measuring directly the amount of water used in a school. They implement technology-based conservation alternatives and make presentations and demonstrations in the community that provide incentive for community involvement in water conservation. Seventh-grade students working with APW on the SWAP won the Governor's

Excellence in Economic Development Award for Future Leaders and their teacher was selected as Water Educator of the Year in Yavapai County. The SWAP won the most innovative program award at the Association of Natural Resource Extension Professionals 2010 Conference.

APW's direct student outreach programs expand and strengthen knowledge on the important topic of water. Arizona Water Festivals provide a good example. Water festivals make learning fun, and they are based on Arizona's educational standards. Over the past few years, Arizona Water Festivals have engaged and instructed 41,354 fourth-grade students and 1,647 teachers in 20 Arizona communities. The model includes 1) pre- and post-festival lessons conducted in-classroom by teachers, 2) teacher professional development, 3) volunteer training, and 4) program evaluation.

According to a 2009 evaluation of program effectiveness, the Water Festivals measurably increased student knowledge about water as well as their enthusiasm for water conservation and learning about water. Objective evaluation also found that students in the classes of teachers who participate in an APW professional development workshop show greater gains than those who do not.

*Blue Ribbon Panel continued from page 3.*

another report or by another agency. The agencies store this information in paper files and multiple electronic databases, which are hard to access and often difficult to compare. This state of affairs creates administrative complexity and added costs for both the regulatory agencies and the regulated community and is not conducive to expanding the use of recycled waters in Arizona.

To address these problems, the Panel recommended that current technology be employed to streamline data submission and management as a means of reducing administrative burden and improving data quality. ADEQ and ADWR would initiate a process to review and revise permit and non-permit data submittal requirements for frequency, consistency, and relevance. Electronic data

submittal to the agencies should be the norm, and the agencies should develop an electronic data management system that would be common and available to all regulators, permittees, contractors, and the public. The system also should incorporate the data needs of the Arizona Corporation Commission in support of their application process and reviews. The Panel recommended that the agencies utilize the expertise of independent information technology professionals as needed and share the cost of developing the data management system.

In the end, the Blue Ribbon Panel recommended no new regulatory programs or major reconstruction of existing programs. Instead, many less dramatic adjustments to Arizona's existing toolbox of water management, education, and research capabilities are highlighted.

The Panel concluded that current programs administered by ADWR, ADEQ, and the Arizona Corporation Commission constitute an exceptional framework within which water sustainability can be pursued.

Although implementation will take time because of the sheer number of recommendations provided by the Panel, a clear punch list now exists. As the agencies begin work on the list, resulting advancements in water conservation and increased use of recycled water will benefit all the citizens of Arizona and stand as a tribute to the dedication and intellect of the participants who contributed long hours to the Blue Ribbon Panel process. *The Final Report of the Governor's Blue Ribbon Panel on Water Sustainability can be accessed at <http://www.azwater.gov/AzDWR/waterManagement/BlueRibbonPanel.htm>.*

*Hydrophilanthropy continued from page 1.*

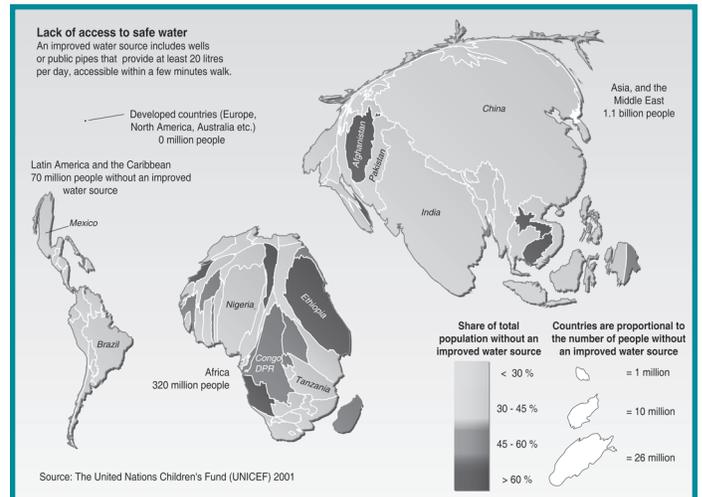
required to make an investment in the project in order to become self-reliant for the future.

3. **Education:** Installing new technology is a good start, but communities must be trained in proper hygiene techniques (hand-washing, toilet use, etc) in order for the technology to be effective. Community members must also be trained in the repair and maintenance of the technology.
4. **Simple Local Technology:** The technology used should be as simple as possible so that it can be maintained and repaired by local communities using local resources. Tools and parts should be low-cost and easily available to the community.
5. **Monitoring and Evaluation:** Visiting groups should make long-term commitments, not short-term visits. Also, the success of the project should be measured by how many years the technology continues to work, not just how many people have access to clean water.

One of the biggest issues in hydrophilanthropy today is that there are several groups working in different countries around the world, but they do not talk to each other. At the recent Arizona Hydrological Society Symposium, David Kremer proposed an online clearinghouse of hydrophilanthropy groups, sorted by geographic area of work. This would allow groups working in the same area to pool resources and learn from one another. This idea is still in the planning phase and would require funding, hosting, and maintenance in order to become a reality.

Want to get involved? No matter what your affiliation, there is a group for you! If you are a student, check out the Engineers without Borders USA, UA Student Chapter. If you are faculty, consider mentoring the student group. If you are a professional, look into the Southern Arizona chapter of Engineers without Borders USA. Also, the organization Water for People hosts the World Water Corps, which is open to anyone.

Most groups require members to raise their own money for trips, but the benefits of volunteering far outweigh the cost. In addition to the good feeling of helping fellow humans, you also get to travel, meet new people, appreciate different ways of life, and learn to be flexible while practicing collaborative problem solving.



*Map showing lack of access to safe water. Design by Hugo Ahlenius, UNEP/GRID-Arendal with data from UNICEF 2001.*

[http://maps.grida.no/go/graphic/lack\\_of\\_access\\_to\\_safe\\_water](http://maps.grida.no/go/graphic/lack_of_access_to_safe_water)

Everyone can support international water work by researching organizational models and choosing to fund or volunteer for projects that will provide sustainable water for at least five years after implementation.

*"If you want to go fast, go alone. If you want to go far, go with others."*

—African proverb

## Resources

Engineers without Borders USA, UA Student Chapter  
<http://www.ewb-ua.org/>

Engineers without Borders USA, Southern Arizona Professionals Chapter  
<http://www.facebook.com/pages/Engineers-Without-Borders-Southern-Arizona-Professionals-Chapter/77106696316>

Water for People & World Water Corps  
<http://www.waterforpeople.org/>



## Public Policy Review

by Sharon Megdal

### Uncertainty: Are We Running Out of Water?



This column focuses on an issue that permeates our state and regional water management challenges: uncertainty. Here are just a few of the uncertainties affecting Arizona's demand and supply picture. Given the downturn in our national and state economies, will Arizona's population grow slower than expected? Will water use patterns change significantly as drought continues? What water supplies will the Central Arizona Groundwater Replenishment District use to meet its long-

term replenishment obligations? To what extent will we reuse our waste water? Will environmental water needs be factored into our water planning? How much and what type of water supplies will be used to meet growing demand for energy, especially given the focus on renewable energy sources? Will water supplies delivered through the Central Arizona Project be curtailed to a significant extent due to shortages on the Colorado River? What will water cost in the future? Perhaps the most fundamental question I hear asked related to uncertainty is "are we running out of water?"

Major studies are underway to help get a handle on these uncertainties. The *Final Report of the Blue Ribbon Panel on Water Sustainability* contains many recommendations related to water reclamation and reuse and has recommended more focused Arizona-based investigation on the water-energy nexus. The Water Resources Development Commission, whose report is expected in October 2011, is working on projections of water supplies and demands and estimates of water infrastructure costs. The Central Arizona Project continues to work on securing water for CAGRDR replenishment to meet its legally mandated obligations. The ADD (Acquire, Develop, and Deliver) water process is looking at meeting future demands. But what water will actually be available for these purposes and at what cost remains unknown. Much work is focused on modeling the Colorado River and understanding the implications of drought and climate variability/change. Holding junior priority to Colorado River water, CAP has to be very concerned about shortage declarations.

I'd like to single out this last issue for further discussion because it is receiving so much media attention. On October 29, 2010, the website 247wallst.com posted the article "The Ten Biggest American Cities That Are Running Out Of Water" (<http://247wallst.com/2010/10/29/the-ten-great-american-cities-that-are-dying-of-thirst/>). The website bills itself as "providing insightful analysis and commentary for U.S. and global equity investors." The ranking was based on the July 2010 NRDC (Natural Resources Defense Council) study, "Climate Change, Water, and Risk: Current Water

Demands Are Not Sustainable" (<http://www.nrdc.org/globalwarming/watersustainability/>). The 247wallst.com report has Tucson as number eight, Las Vegas as seven; Phoenix as three; and Los Angeles number one! Four of the major cities in the Lower Colorado River Basin were among the top 10 and the reasons are related to Colorado River flows. This is some of what was written for Tucson: "Currently, the Tucson region uses about 350,000 acre-feet of water per year. At this rate, Tucson's groundwater supply, which now provides the majority of the city's water, has a very limited life span. In addition to this, the city is currently bringing in 314,000 acre-feet per year from the Colorado River under the Central Arizona Project. However Tucson is growing rapidly... This, combined with the political uncertainty of the Central Arizona Project allocation, places Tucson at extreme risk for future water shortages." About Phoenix they write: "Like many of the other western cities on this list, Phoenix is extremely dependent on water imported from the Colorado River. This is because nearly half of the water the city's residents use comes from this significant source. As the Colorado River Basin enters the eleventh year of its drought, the city's reliance on the river may soon become a serious problem. If the drought continues, water deliveries to Arizona could potentially be cut back. To keep up a sufficient water supply, Phoenix is adopting an aggressive campaign to recycle water, replenish groundwater and try to dissuade over-consumption. Time will tell if these measures will be enough."

The article and the NRDC report reflect the uncertainties associated with Colorado River supplies delivered through the Central Arizona Project. Regardless of inaccuracies, inconsistencies or omissions, the information presented begs the question: what are we in Arizona doing to address the uncertainties? In fact we are doing a lot. The Arizona Water Banking Authority has stored considerable water for future shortages. The seven basin states, with the Department of Interior, crafted shortage-sharing regulations designed to limit impacts to municipal water users when a Colorado River shortage is declared, something now considered more likely than just a short time ago. Utilities are engaged in scenario planning and adopting multi-pronged strategies, including increased conservation, for meeting growing demands.

However, publicly accessible information at the sites people are most likely to go for information appears limited. My searches of the CAP and Arizona Department of Water Resources websites found little information that would be handy for reporters and others interested in how Central Arizona is preparing for a declaration of shortage on the Colorado River. While we cannot necessarily reduce the uncertainties, we can and should explain to the public how the water community is addressing them. Working in partnership with others, the WRRC may need to add this task to its to-do list. 🏗️

## WRRC 2011 Annual Conference

### *Salinity and Desalination in the Southwest: Challenges and Opportunities*

Pivot Point Conference Center/Hilton Garden Inn  
Yuma, AZ

**April 26–27, 2011**

Desalination of poor quality inland waters and coastal sea water offers a vision of endless fresh, clean water to augment limited supplies for the Southwest. But is it really the answer? What are the benefits and costs of desalination, and what are the opportunities and barriers?

The conference will explore the role of desalination in expanding our water supplies and will provide an overview of the current status of desalination policy, operations, technology, costs, energy needs, and environmental issues. The current test run of the Yuma Desalting Plant will be a focus of discussion by U.S. Bureau of Reclamation officials and a policy level panel including David Modeer, General Manager of the Central Arizona Project. Commissioner Michael Connor of the U.S. Bureau of Reclamation and Abraham Tenne, Director of Desalination for the Israel Water Authority, have been invited to give keynote talks.

Plan on joining us to hear the latest on this hot topic and learn how water managers at all levels are addressing the complex issues of desalination and salt management now and for the future. The conference will bring together research scientists, decision makers, water managers, and others from industries, consulting firms,



*View of 1 of 3 solids contact reactors at the Yuma Desalting Plant.  
Photo: Andy Pernick, Bureau of Reclamation.*

governmental agencies, research institutes, and universities to share their knowledge and discuss desalination in our region.

Conference attendees will have an opportunity to tour the Yuma Desalting Plant, one of the world's largest reverse osmosis desalination plants!

A poster session will be offered to complement the oral sessions. Watch for more information.

Mark your calendars for April 26–27, 2011! 