Hi Stewards & Supporters!

Welcome to our Spring 2008 issue of RECHARGE! As I write this, I see roses already blooming outside, a sure sign that warmer temperatures are on the way. March and April are busy months in Arizona, with lots of outdoor activities and festivals to celebrate our state’s beautiful landscapes and weather. The spring months also host events to recognize challenges we face as a global community and to celebrate the strides we’ve already made in protecting our valuable resources.

March 22nd is World Water Day (http://www.worldwaterday.org/) and this year’s focus is on sanitation; unlike many developing countries, we are fortunate in the U.S. that we generally have good sanitation systems. However, water quality monitoring in recreational areas, such as state parks, is showing high levels of bacteria in some locations due to overuse of bathroom facilities or lack of on-site sanitation. This is a concern for all of us who enjoy our public lands and as Stewards, we shoulder the responsibility for educating others about this issue.

Exactly one month later, Earth Day (www.earthday.net, www.earthday.gov) will be celebrated on April 22nd across the globe. Whether or not there is an event in your community, this day is an opportunity to recognize our nation’s heightened awareness of environmental issues and to reaffirm your commitment to protecting the health of your watershed through personal and community actions.

On a more local level, I am thrilled that our readership has increased over 40% since the beginning of 2007 and more than 500 people across Arizona are receiving RECHARGE each season! Our highlights in this issue include feature articles about reclaimed water and wet/dry mapping, both very timely topics as drought conditions persist throughout the Southwest. In addition, we are excited to announce a new section that will focus on various non-point source pollution issues across the state. Finally, we are proud to announce the Stewardship Awards for 2007 – take a look at the awesome efforts of your fellow Stewards! Congrats and thanks to all of you who work to make this program a success!

Sincerely,

Candice Rupprecht
MWS Statewide Coordinator
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520.621.1268
Reclaimed Water: Too Precious to Waste
By: Channah Rock, Water Quality Extension Specialist
Assistant Professor, College of Agriculture & Life Sciences
Soil, Water and Environmental Science Department
University of Arizona

A nexus of factors are currently pressuring Arizona’s water resources; these factors include a growing population, ongoing drought, and recognition of the importance of ecological systems, such as riparian areas. Accordingly, water managers are considering all available sources of water supply, including municipal effluent, or reclaimed water. These increasing demands on limited water resources have made wastewater reclamation for municipal irrigation an attractive option for extending water supplies in the semi-arid Southwest. However, there remain questions about the long-term sustainability of reclaimed water use for irrigating public and recreational areas.

Reclaimed water is the product of various treatment processes used to clean wastewater. Water reclamation, also known as water reuse or water recycling, is the collection and treatment of wastewater from homes and businesses to be utilized where potable (drinking-quality) water is not required. Reclaimed water can be used for landscape irrigation, decorative water features, and in various industrial processes.

The use of reclaimed water conserves drinking-quality water and may also delay costly expansion of water treatment facilities, which means lower water rates for City water customers. In addition, reclaimed water provides a readily available and reliable source of water, even during times of shortage, like a drought. Reclaimed water supplies also will increase as population increases.

Using state-of-the-art treatment and disinfection technologies, a water reclamation facility removes harmful substances from wastewater. Monitoring and testing are routinely performed to ensure the quality of reclaimed water is compliant with all regulations. While reclaimed water is not intended for drinking or swimming, it is completely safe to use for irrigation in parks and common areas.

Water safety is the primary concern of your local utility departments. Safety is achieved by coordinating technology and qualified staff members to monitor production systems, sample the distribution system, and evaluate opportunities to continually enhance the program while minimizing cost to customers.

Numerous tests are performed on water by plant operators each day, and several parameters are monitored continuously using state-of-the-art equipment, which notifies staff members of any deviations from acceptable conditions. Once the water leaves the water treatment plant, samples are taken within the distribution system to ensure water quality standards are maintained.

Reclaimed water pipes are colored purple and are clearly labeled with the words “Reclaimed water – do not drink.” The pipes are completely separate from the drinking water system.

Many municipalities in the state have extensive reclaimed water systems; some even provide it to customers for residential landscape irrigation. In 2003, the City of Tucson delivered 3.7 billion gallons of reclaimed water to about 600 schools, golf courses, and parks, which saved enough drinking water to supply more than 30,000 families for a year. There are also several communities in Florida, California, Washington, and North Carolina that have extensive water reuse programs.

Continued on the next page...
Because reclaimed water may be vital for growth here in the southwest, there is a critical need to assess reclaimed water generation and reuse in Arizona, both statewide and on a regional basis. Scientists at the at the University of Arizona, Arizona State University, and Northern Arizona University have combined efforts to assemble information on reclaimed water generation and reuse across the state. Additionally, the research team proposes to evaluate current water reuse incentive programs and provide insight into public and industry perceptions regarding recycled water reuse. The end goal is to facilitate efforts of state and local actors to match end use needs with treated reclaimed water sources.

Gathering and organizing this information is timely because communities are evaluating and implementing programs for greater use of reclaimed water as an alternative supply to conserve and extend existing potable supplies and as a part of adequate or assured water supply determinations. This data also is of importance for assessing and predicting the changing role of effluent in sustaining riparian ecosystems along the state’s waterways.

There are several ways you, as a citizen, can have a voice in the decisions made regarding the water systems in your community. You can attend and participate in City Council meetings, Citizen Bond Committee meetings, or Active Management Area meetings. These forums all provide ways for you to express your opinions regarding water use in your community and allow you to learn more about the decision-making process.

You can get involved by learning more about water sources and water uses in your area through active participation in the Master Watershed Steward Program. Additionally, as part of the Extension community, one of the Water Quality Program goals is to increase reclaimed water education and research throughout communities of Arizona. Currently, we are developing interactive programs to engage the public and inform them about the water that is being produced and recycled in various communities across Arizona. Our goal is to increase awareness of water issues here in Arizona and promote sustainability through use of reclaimed water.

If you have questions about reclaimed water or the Extension Water Quality Program at the University of Arizona please feel free to contact me at any time. I look forward to meeting and working with all of you throughout the development of this program! (Contact information below)

**Continuing Education Opportunity!**

**Purple Pipes: Promises and Precautions for Water Reuse**

Come learn about water reuse in Arizona! In collaboration with the University of Arizona Cooperative Extension, the University of Arizona Water Sustainability Program is offering a one day water reuse workshop to inform community members about water reuse and recycling in Arizona.

Leading Arizona experts in water quality, municipal irrigation, turf grass management, and public health will discuss benefits and precautions of using reclaimed water in the semiarid Southwest. Additionally, facilitators from government agencies and local water utilities will discuss what they are doing to increase water conservation through water recycling while protecting human health.

**WHEN:** April 16th 9:00am-3:00pm
**WHERE:** Maricopa Agricultural Center, Maricopa, AZ
**CONTACT:** Channah Rock

**CONTACT INFORMATION:**
Channah Rock
channah@cals.arizona.edu
520-381-2258
Thank you to all MWS volunteers for your hard work and contributions throughout the state. Last year volunteers contributed over 2,400 hours in a variety of citizen science, education and outreach efforts! There are three award categories, Most Volunteer Hours Worked Overall, Most Volunteer Hours per Activity Type, and Most Active Newcomer Award. Awardees will be contacted for a small gift of our appreciation for all your hard work.

**MOST HOURS per ACTIVITY TYPE**
(types taken from MWS Volunteer Database)

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<thead>
<tr>
<th>Activity Type</th>
<th>Volunteer</th>
<th>Name</th>
<th>Total Hours</th>
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<tbody>
<tr>
<td>Administrative/data entry</td>
<td>Barbara Brunner</td>
<td>Curt Chestnut</td>
<td>233</td>
</tr>
<tr>
<td>Formal/informal education</td>
<td>Mike Whittaker</td>
<td>Mike Whittaker</td>
<td>223</td>
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<tr>
<td>GPS/GIS/mapping</td>
<td>Pat O’Malley</td>
<td>Linda Carey</td>
<td>205</td>
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<tr>
<td>Habitat restoration/enhancement</td>
<td>Curt Chestnut</td>
<td>Elaine Morral</td>
<td>195</td>
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<tr>
<td>Participation in watershed partnerships</td>
<td>John Jarchow</td>
<td>Barbara Brunner</td>
<td>158</td>
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<tr>
<td>Public speaking</td>
<td>Elaine Morral</td>
<td>Lois Hirst</td>
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<tr>
<td>Research support</td>
<td>Carianne Funicelli</td>
<td>Scott Harger</td>
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<tr>
<td>Water sampling/testing</td>
<td>Beverly Sass, Bill Sugars</td>
<td>Russ Fosha</td>
<td>127</td>
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<tr>
<td>Watershed restoration</td>
<td>Russ Fosha</td>
<td>Norma Russell</td>
<td>110</td>
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<tr>
<td>Writing publications</td>
<td>Scott Harger</td>
<td>Judy Curtis</td>
<td>108</td>
</tr>
<tr>
<td>Youth education/outreach</td>
<td>Norma Russell</td>
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**MOST HOURS WORKED**

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**MOST ACTIVE NEWCOMER AWARD**

John Jarchow of Navajo County (64 hours). Read more about John’s activities on page 7.

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**THE SPRING PHOTO CONTEST WINNER IS...**

Sharyn Baker of Prescott, Arizona

Congratulations Sharyn! Thank you for sharing this fantastic photo of a Painted Lady butterfly (Vanessa cardui).

Thank you for all the great photo submissions! Please remember that if your photo did not win this or other contests you have entered, you may re-submit them in the future.

The SUMMER photo contest deadline is **June 3rd**. I look forward to seeing more of your beautiful photos.
This coming June, the Arizona NEMO program (Nonpoint Education for Municipal Officials), a University of Arizona Cooperative Extension Program, with assistance from the BLM, Upper Agua Fria Watershed Partnership, Friends of the Agua Fria National Monument, and the Arizona Riparian Council will begin the first in an annual series of volunteer based mapping projects along the Agua Fria River. The Agua Fria River is approximately 120 miles long with about 25% flowing through Agua Fria National Monument. The Agua Fria wet/dry mapping program is part of a larger statewide effort to develop baseline data regarding perennial stream flows.

More than 70 people attended a one-day training session this winter near Mayer, Arizona to learn the protocol for identifying and recording the wet and dry areas of the Agua Fria River. NEMO completed a similar project for the middle San Pedro River in 2007 and is using the same protocol, developed by the BLM and Nature Conservancy, for the Agua Fria River. The training brought together local citizens and representatives from governmental and non-profit organizations who are interested in helping collect valuable data on long terms trends for the Agua Fria. Representatives from the Bureau of Land Management, ADEQ, ADWR, ASU, and Yavapai County also attended the training. In addition to the on-the-ground training on GPS mapping, training included a video of the NEMO Wet/Dry volunteer mapping effort on the San Pedro River. Project coordinator and senior research specialist, Lainie Levick, is excited about the number of people who have volunteered to assist with the effort. “We are excited about the turnout… the more people we have, the more miles of river we can map and the more successful this project will be.”

June is the ideal month to complete wet/dry mapping because it is the driest time of year and is before the onset of the monsoon season. Streamflow measured at this time is considered perennial flow for the river. Annual mapping can provide valuable data on long terms trends and changes to these base flows. On June 21st volunteers will be divided into groups and assigned a segment of the Agua Fria River. Starting early in the morning, volunteers will head out with GPS units and data sheets to accurately record their observations. Data sheets include entries for whether water is pooled or flowing as well as starting and stopping points for streamflow (in the form of GPS coordinates). Volunteers will also note other observations such as the presence of fish, wildlife, illegal dumping and/or vehicle tracks in the river.

“The purpose of NEMO is to provide information to help communities protect their water resources and to educate land-use decision makers about the impacts of non-point source water pollution,” said Levick. Projects like this help support NEMO program goals by providing long term data of environmental conditions in the watershed. In addition to projects like the volunteer led wet/dry mapping program, Arizona NEMO creates watershed-based plans to achieve water quality standards and protection goals for watersheds across Arizona. These plans identify areas susceptible to water quality problems and pollution, sources that need to be controlled and management measures that must be implemented to protect or improve water quality.”

For additional information about the Agua Fria wet/dry mapping event, please contact: Lainie Levick, 520-670-6380 ext. 176 or by email at lleveck@email.arizona.edu

For more information about watershed based plans or the Arizona NEMO program in general, please visit the program website available at www.ArizonaNEMO.org or contact the program coordinator: Kristine Uhlman, 520-792-9591 ext. 51 or by email at kuhlman@ag.arizona.edu
NON-POINT SOURCE POLLUTION IN ARIZONA
By Shaneesta Sanfilippo
ADEQ Intern

DEFINITION (U.S. EPA)
Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
- Oil, grease, and toxic chemicals from urban runoff and energy production;
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems;
- Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.

CASE EXAMPLE: Luna Lake
POLLUTION TYPE: Nutrient Loading

WHAT
Nutrient loading is a non-point source (NPS) pollution problem in the State of Arizona. Nutrient loading, loosely defined, is the quantity of nutrients entering an ecosystem in a given period of time. Luna Lake is one example of a waterbody in Arizona that is affected by nutrient loadings from nonpoint sources.

WHERE
Luna Lake is located in the Apache-Sitgreaves National Forest in Apache County, Arizona. It is a man-made impoundment on the San Francisco River, 11 miles south of its headwaters in the ponderosa/ mixed conifer forests of the San Francisco Mountains. Water quality samples collected from the lake between 1995 and 1997 indicated an excess of aquatic weeds and phytoplankton. Low dissolved oxygen and high pH levels are generally related to nutrient enrichment problems in lakes. In accordance with state water quality standards and goals, the Arizona Department of Environmental Quality listed Luna Lake as an impaired water body for nutrients including low dissolved oxygen and high pH.

SOURCES & IMPACTS
Several sources may contribute to excessive nutrient loading in Luna Lake. These sources include septic systems, forest, agricultural, residential, and commercial runoff, and decomposition of aquatic plants. The movement of sediment also contributes to nutrient load problems. Agricultural loading is largely attributed to grazing activities in the watershed. Animal waste is a plentiful source of nutrients and soil compaction caused by extended grazing increases the rate of runoff during storm events. Residential nutrient loads are a result of increased impervious surfaces and soil amendments (i.e. fertilizers, etc.) used by residents, along with other materials associated with residential development.

Nutrients (such as nitrogen and phosphorus) in excess can result in a nutrient laden condition known as eutrophication, often with high concentrations of algae and aquatic weeds during summer days. This increases the risk of elevated algal toxin levels in the lake. Elevated nutrient levels within Luna Lake stimulate aquatic plant growth, in turn increasing carbon dioxide consumption. As a result, pH levels in the lake increase. High pH levels increase the concentration of unionized ammonia, which is extremely toxic to organisms and can result in fish kills. Each of these conditions can result in a variety of negative impacts. Recreational activities such as swimming, boating, and fishing can be affected. Public water supplies are affected because the nutrient loading results in altered taste and odor and may require further treatment to clarify for use.

Continued on next page...
John’s interest in water issues was greatly impacted by living in Tucson and participating in water conservation efforts sponsored by both the City of Tucson and numerous community-based organizations. Having lived on both coasts and both borders, John is very aware of the wide disparity of water policy and usage practices throughout the country. Now a full-time resident of the White Mountains, John participated in the 2007 MWS program in Navajo county. His enthusiasm, positive attitude and knowledge were great assets in the class. His willingness to participate in class projects, field days, extra training sessions has been infectious to the other participants and a great benefit to his community.

John continues to maintain a high level of involvement in the community and has been involved in multiple projects including the Show Low Creek Watershed Enhancement Partnership, the Weed Management Program, the Woodland Park Acquisition initiative, Rainlog.org, and the Navajo County Drought Impact Group. John is currently working with the Nature Conservancy on an assessment of open space for the Town of Pinetop-Lakeside. When complete, this assessment will not only evaluate and propose conservation options for open space, but will also recommend tying individual parcels together with the existing and proposed trail systems and area creeks, springs and lakes into a larger open space network.

Thank you John for all your hard work!!

Continued from previous ...

MITIGATION TOOLS
Total Maximum Daily Load reports (TMDLs) are a mechanism established in the Clean Water Act for situations where water quality impairments cannot be mitigated by permitting and point source pollution controls alone. The TDML as the name implies is a maximum daily load limitation for the pollutant of concern for a specific waterbody. It is based on the loading capacity of the water body to point sources, non-point sources, and includes a margin of safety. The TMDL also identifies possible causes of impairment. A TMDL has been developed for Luna Lake.

The Luna Lake TMDL identifies the multiple options to mitigate NPS pollution; these practices are commonly referred to as best management practices (BMPs). One solution is a series of voluntary grazing BMPs by local landowners and ranchers to reduce runoff and loading from pastures; these BMPs would also be effective in reducing nutrient loading from elk. Residential BMPs include septic system upgrades to stop toxic nutrients leaching into the lake, reduced fertilizer use and the installation of vegetated filter strips to slow runoff and absorb nutrients.

GET INVOLVED
Another way that individuals can help reduce their contribution to NPS pollution is by getting involved with or forming a watershed group to build support for the implementation of BMPs like those listed above. A watershed group can provide residents with the necessary tools for coordinating activities to design, pursue funding, and apply solutions to water quality issues within their watershed. There are many large, active watershed groups throughout Arizona. The Master Watershed Steward Program has a resource guide which lists active groups in your area. You can download a copy of the guide from the MWS homepage: http://ag.arizona.edu/watershedsteward/
The Arizona NEMO program [www.arizonanemo.org] can be consulted for specific techniques and potential sources for funding for BMP implementation. Residents within these watersheds can work with both the Master Watershed Steward program and the Arizona NEMO program to become more involved in their local watershed.

For more information about water quality in Arizona, please visit: http://www.azdeq.gov/environ/water/index.html
The Rewards of Giving Back: Volunteer Tax Deductions

Tax season is upon us and if you haven’t already filed your taxes, this information may help you itemize deductions for non-cash charitable deductions. Information below is taken directly from IRS Publication 526, Charitable Contributions. For more detailed information, please refer to the IRS website (http://www.irs.gov/) or ask your tax advisor.

1. Car expenses - You can deduct unreimbursed, out-of-pocket expenses, such as the cost of gas and oil that are directly related to the use of car in giving services to a charitable organization, such as MWS. You cannot deduct general repair and maintenance expenses, depreciation, registration fees, or the costs of tires or insurance. You can deduct an amount of $0.14 per mile for travel directly to and from the place of your volunteer service.

2. Tolls and parking fees are deductible.

3. Personal time or labor is not deductible.

4. Travel Expenses - If the volunteer service required travel overnight, you can deduct lodging, transportation and meal costs. However, your travel must be primarily to provide services for the charitable organization, not for personal vacation or recreation.

5. Uniforms – You can deduct the cost of buying and cleaning uniforms if the clothing is not suitable for everyday use and you must wear the uniform when volunteering.

6. You must keep records for each volunteer activity, which includes:
   A. Day and time of service, mileage and all unreimbursed receipts.
   B. Name of organization and description of services you provided.

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