

# Water, Economic Development, and Sustainability Program

## **REQUEST FOR PROPOSALS ON WATER RESEARCH, OUTREACH, AND EDUCATION**

The Water, Economic Development and Sustainability Program (WEDSP) of the University of Arizona is funded by the Technology and Research Initiative Fund (TRIF), also referred to as Proposition 301 research funds, administered by the Arizona Board of Regents. This call for proposals is issued based on the WEDSP Business Plan submitted to the Arizona Board of Regents in the fall of 2002.

### **INTRODUCTION:**

Water is crucial to Arizona's economy and to the health and well being of its residents. The availability of water shapes the environment in which we live and directly affects our quality of life. A good understanding of all aspects of water, including supply and quality, is essential to the long-term sustainability of the state and its economic development. In addition, a thorough understanding of the interrelationships among the scientific aspects and the economic, legal and policy aspects of water demand is vitally important to decision-makers.

University of Arizona (UA) faculty have attracted major federal and private funding for water-related research during the past five years. This has culminated in the establishment of three NSF sponsored water centers: the Engineering Research Center for Environmentally Benign Semiconductor Manufacturing (ERC); the Center for Sustainability of semi-Arid Hydrology and Riparian Areas (SAHRA); and the Water Quality Center (WQC). In addition, the Water Resources Research Center (WRRC) has played a coordinating role among the three state universities since 1957, and continues to receive federal grant support through the United States Geological Service. The WEDSP designates four water centers as the principal centers for distributing funds to UA faculty and staff for research, outreach and education in the water area. Funds for the program became available with the passage of Prop 301 (the education sales tax) by Arizona voters in November 2000.

At the University of Arizona, water was selected as a main focal area for economic development to be stimulated with TRIF funds. Although water has always been a major research area for several of the disciplines at UA, what had been lacking was adequate funding for studying Arizona-specific problems.

In year three of a five-year program, the competitive grants program is intended to encourage partnerships between the four water centers and entities from the private and public sectors. The program should serve to strengthen research, outreach and education efforts, to ensure a sustainable, high-quality water supply for economic development and enhanced quality of life for all of Arizona.

## **WHO CAN APPLY:**

Only faculty members and staff at the UA may submit proposals, but joint funding with investigators and stakeholders from outside the UA is encouraged. Researchers in any of the social, biological, physical, and engineering sciences and fields, such as water management, water law, and health sciences, are invited to apply. Pre-proposals are required.

The proposal guidelines are available on the web site of the Water Resources Research Center (<http://ag.arizona.edu/azwater/>), which is linked to the web sites of ERC, SAHRA and WQC.

## **DATES OF SUBMITTAL:**

Deadline for pre-proposals is December 3, 2002.  
Feedback on pre-proposals from Center Directors by January 15, 2003.  
Full proposals are due March 1, 2003.  
Funding for the proposals will start July 1, 2003.

## **FUNDING AREAS:**

Proposals are accepted in all areas related to water. However, for the 2003 request for proposals the following targeted areas listed in no particular order will be given preference for funding:

1. **Drought Planning:** In a region experiencing intermittent periods of drought, drought planning is required to minimize the impacts of drought to protect natural resources and the state's economic base. Both long and short-term measures are needed to mitigate the adverse effects of drought. Research in this area might include developing and updating hydrologic/economic models of drought scenarios, modeling potential costs to water users of long-term drought, and developing strategies for reducing the economic effects of long-term droughts in Arizona. Analyzing effects of long-term climate and weather variability on surface water supplies, modeling climate change, and estimating drought recurrence and flood frequency are research areas of interest. Water resources planning for urban and rural communities in the state is an important component of this target area. Also of importance are the legal, economic, and policy issues of drought planning.
2. **Storage and Recovery:** Arizona stores large quantities of Colorado River water and increasing amounts of effluent in the subsurface to be used for drought protection, interstate banking, and to meet other water management objectives. As storage of water in the subsurface continues to expand, suitable recharge and recovery areas need to be identified. Research may include studies to evaluate the potential hydrologic or water quality constraints on the role storage, recharge, and recovery can play in future water supplies. Additionally the effects of storage methods and recovery on land use requirements, social and environmental impacts, and costs need to be investigated. Analysis of subsidence and aquifer properties is needed. Legal, economic, and policy implications should be considered.
3. **Treatment and Recycling:** This area includes research and technology development related to the following: existing potable and industrial water treatment systems; municipal effluent and waste reuse; new treatment technologies for the production of potable water from locally available supplies; treatment of wastewater for potable use

optimized for conditions and requirements in Arizona; integration of technologies as well as economic and policy considerations in the selection and evaluation of treatment systems, which would allow for increased reuse and recycling of water by industry; novel technologies for monitoring of water quality for drinking water purposes; real-time monitoring systems to protect against water intrusion via chemical and biological contaminants; remediation of contaminated groundwater; desalination and/or disposal of brackish and effluent water; and use of water of impaired quality for irrigation.

4. **Integrative Water System Simulation:** This effort focuses on developing a modular and yet comprehensive simulation-tool for the study of Arizona water resources at the basin level. It seeks to integrate isolated research findings into a whole that is greater than the sum of its parts. Such a model could highlight areas where research is most needed, turn fragmented research results into integrated decision support tools, and provide important educational tools. Modules could focus on water quantity, basic quality parameters (e.g., TDS, TOC), and/or costs associated with water sources, storage and distribution networks, treatment facilities, reclaim/recycle units, or major water uses. A multi-disciplinary team effort will be needed to develop modules of a simulation tool and methodology that can be used for forecasting and planning by researchers, policy makers, and water users in Arizona.
5. **Other Research Areas:** There are important research areas in addition to those presented above. Strategies are needed for meeting the water resource needs of Arizona's growing population and economic base, particularly in rural parts of the state, and for the management of water for environmental purposes such as the enhancement of riparian areas. Means to accommodate such needs in a scientifically sound, cost-effective manner, and based on established legal principles need to be developed. Also, study of the effects of water quality on public health is an important area. Water quality can be affected by agricultural practices, industrial use, municipal waste use, recharge, transport through open canals, and by surface and underground storage. The effects of these various processes on drinking water quality, and specifically public health and public acceptance are not well understood, and need to be investigated. Further, the cost-effectiveness of alternative methods of water conservation needs to be demonstrated so that appropriate demand side management can be implemented.
6. **Water Outreach and Education:** Education and outreach are critical areas for the transfer of water-related research information for the practical education and general awareness of the public and K-12 students and to meet the specific needs of water professionals and policy makers. Non-technical and targeted short courses, publications, newsletters, research reports, curriculum modules, water information centers, demonstration gardens, conferences and other marketing strategies need to be developed to further enhance and improve the understanding of water issues in the state. Multi-disciplinary programs need to be developed that promote knowledge of water issues at the K-12 level and offer informal experiential education aimed at the public in general. Programs that build on existing curricula and available educational resources are encouraged. Proposals should include plans for implementation. Building lasting partnerships with industry, state and federal agencies, school districts, water districts, and state parks to implement water education, is a major goal of this target area.

**FUNDING INFORMATION:**

It is expected that most single investigator, research and outreach proposals will be funded at about \$25,000 to \$50,000 direct funds per proposal per year. Multi-investigator proposals are encouraged and may be funded at higher levels. Proposals may be funded for up to three years, subject to yearly review, progress made and funding available. There will be no indirect costs, but personnel costs should include fringe benefits. Researchers are strongly encouraged to negotiate matching funds from the private sector, utilities or governmental agencies. Researchers are also strongly encouraged to provide student opportunities in their proposals. The total amount of funds available for this RFP for FY 2004 starting July 1, 2003 is expected to be \$1,000,000.

**PROPOSAL REVIEW:**

A review panel composed of faculty from the University of Arizona and possibly Arizona State University and Northern Arizona University and technical reviewers from Federal and State Agencies and private firms experienced in the field of the proposal will review all proposals. The proposal review process will be similar to the review process used by Federal Agencies like NSF, NASA, DOE or EPA. Using the recommendations of the Review Panel and available funding, the four center directors will make final award decisions.

**PROPOSAL SELECTION CRITERIA:**

- 1. Relevance to resolving water issues important to communities within Arizona.**
- 2. Technical merit of the proposal and competence of the PIs.**
- 3. Leverage of TRIF funds via matches from the private sector, utilities, or governmental agencies.**
- 4. Partnerships with industry and other agencies.**
- 5. Documented linkage to one or more of the four water centers.**
- 6. Inclusion of educational/outreach components.**

**PRE-PROPOSAL GUIDELINES:**

The pre-proposal should be no longer than 2 pages single spaced, that should include the following 6 elements, the approximate funding requested, and the partnerships/leverage formulated.

- 1. Title**
- 2. Targeted areas:** List one or more of the above listed targeted areas applicable to the proposal, with the most preferred targeted area first.
- 3. Duration:** (month/year to month/year). Use the actual beginning and estimated ending dates for projects.

4. **Principal Investigator(s) name(s) and College/Department**
5. **Statement of critical regional or state water problems:** Include an explanation of the need for research, who wants it, and why (2 paragraphs maximum).
6. **Statement of results or benefits:** Specify the type of information that is to be gained and how it will be used (2 paragraphs maximum).

#### **FULL PROPOSAL GUIDELINES:**

The full proposals shall consist of the following 12 elements/topics. The synopsis (first 6 elements) shall not exceed 2 pages. Begin a new page with element 7 (Nature, scope and objectives of the research).

1. **Title**
2. **Targeted areas:** List one or more of the above listed targeted areas applicable to the proposal, with the most preferred targeted area first.
3. **Duration:** (month/year to month/year). Use the actual beginning and estimated ending dates for projects.
4. **Principal Investigator(s) name(s) and College/Department**
5. **Statement of critical regional or state water problems:** Include an explanation of the need for research, who wants it, and why (2 paragraphs maximum).
6. **Statement of results or benefits:** Specify the type of information that is to be gained and how it will be used (2 paragraphs maximum).
7. **Nature, scope and objectives of the research:** (Start a new page).
8. **Methods, procedures, and facilities:** Provide enough information to permit evaluation of the technical adequacy of the approach to satisfy objectives.
9. **Related Research:** Show by literature and communication citations the similarities and dissimilarities of the proposed project to completed or on-going research on the same topic.
10. **Training potential:** Estimate the number and level of graduate and undergraduate students, by field of study and degrees, who are expected to receive training in the project.
11. **Qualifications of the investigator(s):** Include a resume(s) of the principal investigator(s). The resume shall list pertinent information such as publications (no seminars, abstracts, lectures given etc.).
12. **Linkages to the Centers:** Document how the proposal is linked to programs in one or more of the four water centers (ERC, SAHRA, WQC, WRRRC).

**BUDGET BREAKDOWN:**

Submit a detailed budget, which includes the following line items. (Indicate the amount of cost sharing from private/state/federal units):

1. **Salaries and Wages:** Identify the individuals and categories of salaries and wages, the estimated hours or percentage of time, and the rate of compensation proposed for each individual or category.
2. **Fringe Benefits:** Use rates applicable at the UA for FY04.
3. **Supplies:** These include amounts estimated for office, laboratory, computing, and field supplies.
4. **Equipment:** This is property having a useful life of more than 1 year and an acquisition cost of more than \$5,000 per unit.
5. **Services or Consultants:** Identify the types of services that would be used. List the proposed consultants (including sub contractors), the estimated amount of time required, and the quoted rate per day or hour.
6. **Travel:** List the total costs, in state as well as out of state, for which the money will be used.
7. **Other Direct Costs:** Itemize the costs not included elsewhere; e.g., shipping, computing charges, equipment-use charges, age dating, or other services.
8. **Total Estimated Costs:** Total items (1) through (7).

**PRE-PROPOSAL SUBMISSION:**

Please forward 1 electronic copy and 6 hardcopies of the pre-proposal by December 3, 2002 to:

Water Resource Research Center  
Attn: Jackie Moxley  
350 North Campbell Ave.  
Tucson, AZ 85721

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