



2008-2009 AWI Annual/Final Report

This is a report of AWI's activities in calendar years 2008–2009, which were the third and fourth formal years of existence of the Arizona Water Institute. Included is summary of financial material that serves as the final report for the Arizona Water Institute.

This report includes the following major topics:

- AWI Highlights of 2008–2009
- Building Applied Research Capacity
- 2008–2009 AWI Sponsored Projects
- Jacobs/AWI Outreach Activities
- AWI Operations
- Funding and Fundraising

I. AWI Highlights of 2008–2009

Since its inception, AWI has initiated 60 projects (including faculty incentive grants), 33 of which have been completed, and 5 contracts. There are 27 projects still underway that will be finalized after AWI has formally been disbanded. We have also coordinated or sponsored/cosponsored 2 field trips and 23 workshops/conferences. A summary of the outcomes of the projects from the first two years of project funding is included (Attachment 1).

We brought in a total of \$1.65 million in cash and matching funds, and \$618,583 of in-kind contributions for our projects in the last three years. In addition, our investments led to a series of successful externally funded grants, resulting in \$2.69 million in additional income to the three universities.

Key highlights from the past year include:

- 1) Successful completion of 15 AWI projects on schedule.
- 2) 63 project concept proposals received and 15 approved for 2009 (many subsequently cancelled upon the decision to shut down by July 1, 2009).
- 3) Agreement from the Bureau of Reclamation to extend the Colorado River project – Enhancing Water Supply Reliability through Enhanced Use of Climate Predictions – for at least another two years.
- 4) Completed a detailed summary of project outcomes from all of our projects, and 2-page color handouts (available on the web and included with this report) on all completed grant-funded projects.
- 5) Eight workshops sponsored, some co-sponsored with other entities.
- 6) Development of the Strategic Plan for the Bi-national Institute for Water and Renewable Energy.
- 7) Responded to an ever-increasing demand for information from AWI, including 46 invited talks (Jacobs only - this does not include talks given by other AWI employees and collaborators that relate to our work).
- 8) Received a grant from Christy Walton through the International Community Foundation to initiate a bi-national water training program in La Paz, Mexico – consisting of a series of 6



workshops (three completed, three more in planning stages, to be completed at the end of this year by Placido dos Santos).

- 9) Through a collaborative effort at UA between SAHRA, Biosphere 2, AWI and the Institute of the Environment, we hired a new Assistant Research Professor of Informatics, Matthew Garcia.
- 10) Substantial contract work in multiple areas was negotiated with the Central Arizona Project; two projects have proceeded (the CAP ADD Water Project and the Yuma Desalination Plant project with Wendell Ela and Peter Fox). At the time of the decision to shut down AWI, several additional large projects were still in negotiation, including a monitoring project with Karl Flessa for several hundred thousand dollars, and a project on water and land use on the Colorado River was contemplated.
- 11) We were invited to give a Sackler Colloquium by the National Academy of Sciences on the topic of "Informing Priorities for Water Sustainability Research through Dialogues between Decision Makers and Scientists."
- 12) We gave an invited paper on Arizona Water Management Innovations in Zarragosa, Spain.
- 13) We initiated a thorough evaluation of our program in collaboration with a graduate student at ASU, Clea Senneville, who is completing this assessment of AWI as a "boundary organization" as her master's project in the School of Sustainability. She has interviewed most major players in AWI, including many board members, PIs and staff.

AWI employees Jacobs, dos Santos, and Graf all serve on numerous advisory committees. This year new requests for my participation included:

- Chair, Adapting to the Impacts of Climate Change Committee, National Academy of Sciences, and Member, America's Climate Choices Committee
- Colorado River Hydrology Advisory Board – US Bureau of Reclamation
- NOAA Climate Service Development Tiger Team
- NOAA Climate Services Development Review Panel
- Science Steering Group – Water Cycle Inter-Agency Working Group, US Climate Change Science Program Office (current)

II. Building Applied Research Capacity

Since January 1, 2008, we worked towards building larger scale, higher impact projects as well as expanding the ability of the universities to respond to stakeholder needs.

- In partnership with Harvard University, Arizona State University and the Water Resources Research Center, we sponsored a very successful workshop on climate change adaptation for water managers on February 4-5, 2008, at the Biosphere 2 facility. This has led to several publications and ongoing work in this area.
- On February 21-22, 2008, we sponsored a workshop on energy-water sustainability in the border region (in support of the Bi-national Institute for Water and Renewable Energy) at ADWR, attended by roughly 60 people, with simultaneous translation and multiple breakout sessions.
- In collaboration with Biosphere 2, we supported two workshops, one on energy and water conservation and one on the development of their strategic plan (Jan-Feb 2008).
- We assisted the Arizona Water Pollution and Control Association in a workshop to define priority research needs in March, then sponsored a state of research workshop at the opening session of their annual meeting in May 2008 (attended by 500 people).
- In September 2008, we co-sponsored a Weather Modification workshop at NAU.
- On October 29, 2008, we sponsored an innovative workshop on defining Arizona's Research Agenda in Tempe, featuring the first-ever Arizona's Got Talent Show for water researchers.
- A two-part workshop on surface water-groundwater hydrology is being produced jointly with the Bureau of Reclamation on April 23, 2009, and in the fall of 2009 (this activity is sponsored by Reclamation funding, not AWI, and will continue to move forward).
- We have coordinated the first 3 of a series of 6 workshops in La Paz, Mexico, which were funded by the International Community Foundation to initiate a bi-national water training



program.

- I coordinated a workshop at ASU in February 2009 for the Reclamation downscaling project and have been building funding and staffing for this project.

Because it is clear that information technology will be a critical component of building adaptive capacity, and because our investment in the Arizona Hydrologic Information System (AHIS) needed to be managed more directly, in the summer of 2008 we hired Matthew Garcia as the UA director for AHIS. He previously worked at the NASA Goddard Space Center and has great proficiency in working with complex data bases in multiple formats. He has made major progress in moving the project forward and is currently planning 4 grant proposals in collaboration with his AHIS colleagues at ASU and NAU, as well as other colleagues at UA.

We have been working on several other fronts related to capacity building – assisting tribal entities through several of our grants, working with watershed groups and communities to address specific sustainability issues, working on identifying priority research needs for water treatment and wastewater operations, and supporting efforts to build an employment pathway for water and wastewater treatment plant operators with Gateway Community College, among other examples. I have been working with the Tucson-Pima County Water and Wastewater Infrastructure Planning Committee, helping to define their planning process, select speakers, and develop and review documents, as well as presenting to the committee on water reliability. I have also produced several proposals related to building climate adaptation centers and enhancing the impact of UA research through a proposal called “Research Hits the Road.”

We have continued to add to our list of collaborators and project sponsors. There are a total of 101 entities with whom AWI has collaborated on projects and programs.

III. 2008–2009 AWI Sponsored Projects

A. Grant-Funded Projects

AWI’s project approach this year changed substantially from that used in previous years. Historically, though our projects were managed very differently from other grants, they were selected by a relatively classical 3-level review panel approach. This year we requested that applicants submit “project concepts” rather than proposals. At the end of August, AWI announced availability of up to \$600,000 in funding for collaborative grants, and soliciting concept-level ideas for new projects.

The new approach to the grants process was expected to result in a smaller group of larger, more strategic projects, with at least one project anticipated in each of the research theme areas. Maximum funding per project was to be \$100,000, but projects were expected to include significant cash matching (50% or more of the total budget). Some top priority projects were selected even though they are unable to obtain significant matching funds – mostly funding for workshops and white papers focused on research proposals. AWI expected to put extensive AWI staff resources into the development, oversight and in some cases the actual work for each funded project. A few of the selected projects are still moving forward despite the decision to shut down AWI functions July 1. Availability of faculty incentive grants and student internship opportunities was also advertised on all three campuses and a few of those projects will move forward.

B. Other Priority AWI Projects

I am the project manager for the AWI–US Bureau of Reclamation project, “Enhancing Water Supply Reliability through Improved Climate Predictions.” We are in the fifth year of this major project that involves four PIs (soon to be five) in four different UA departments and five RAs/Post docs.



Significant outcomes of the project to date include further extending the tree ring record for the Upper Colorado to the prehistoric period, an extension of roughly 1200 years. Project investigators are also developing a new method for predicting precipitation within watersheds based on sea surface temperatures, and multiple publications including *Eos*, *Journal of the American Water Works Association*, *Bulletin of the American Meteorological Society*, *Journal of Geophysical Research*, *Water Resources Research*, etc. The economics team has been supporting Reclamation assessments of innovative water marketing techniques such as auctions. This team has been selected to receive a “Partners in Conservation” award from the Secretary of the Interior.

AWI has been the Arizona coordinator of the Arizona-Sonora Bi-national Institute for Water and Renewable Energy. AWI held a major conference in February and prepared a summary, serving as the key convener of this effort. Placido dos Santos has played a significant ongoing role in US-Mexico discussions of water and energy and was able to assist in selection of an Arizona firm for work on desalination efforts in Rocky Point.

IV. Jacobs/AWI Outreach Activities

In the past 12 months, I prepared and gave 46 presentations and we organized or co-produced 10 conferences and workshops. Placido and Chuck, the AWI Associate Directors, gave an additional 10 presentations. The presentations of the AWI Campus Coordinators are not itemized in this report. We prepared a total of 18 public handouts for AWI. We now have a set of handouts that can be used for different audiences that were updated on a regular basis, including 2-page project summaries for all of the completed projects that are available as handouts and on-line.

- The AWI website was updated weekly and continues to be well used and received.
- I appeared in a national documentary, “Running Dry in the Southwest”, and was filmed for two other documentaries on drought and water supply issues in the west (no ETA on either of the other two, but the Running Dry documentary has been playing nationwide on public television).
- A mailing list of over 2,300 individuals has been receiving the AWI e-newsletters (three were prepared during 2008).
- In the last year, I have appeared on KUAT TV twice – once related to the National Academy panel on climate change, once on a panel reviewing the Running Dry movie.

V. AWI Operations

A. AWI Central Staff/Support

SAHRA continued to provide office space, furnishings, computer and administrative support for the central office. Although we had a major setback in our administrative functions for this year and had only a half-time student for support for 6 months, we hired a new Program Manager in November, Mary Lovely. She has been doing an excellent job. Our student, Stephanie Polm has been amazing, keeping the AWI office functioning from April through November. She took on most of the functions of our office with virtually no notice or training, and has been our web master for the past year. Rachel Nielsen at the UA VPR office has provided excellent administrative support on all our business transactions.

Now that we are in shut-down mode, AWI staff transitions have already begun. Anna Spitz, who had been the UA Coordinator, has moved on to a job with the B2 Institute and the UA SkyCenter. Jim Holway, who has been managing the ASU-AWI office more or less single-handedly since his assistant Jina Olbinski moved on, has accepted a position at the Sonoran Institute. Paul Gremillion and Abe Springer have shared the coordination activities at NAU; Abe will now become the Director of a new Earth Sciences School at NAU, and Paul will continue on as a faculty member at the university. Mary Lovely and Stephanie Polm, who will be laid off as a result of the AWI closure, are actively seeking other employment.



B. AWI Meeting Coordination

AWI central staff scheduled multiple AWI meetings, including weekly coordination meetings, several Executive Committee meetings and business manager meetings, and all-staff and External Advisory Committee meetings twice a year. External Advisory Committee meetings were held in January and October of 2008. Central office staff, assisted by Jina Olbinski at ASU also supported all of the workshops, some of which were multiple-days with very complex arrangements.

C. Campus Coordinators

All three coordinators maintained campus list-serves and held meetings to facilitate communication with faculty and students and promote generation of project ideas and funding opportunities as well as efficient management of projects.

- Anna Spitz (UA) was the project manager for multiple AWI projects, assisted with the newsletter and with tracking funding for projects. She worked on several letters of intent for grant applications and managed the UA intern and faculty incentive programs.
- The AWI office at ASU has been located at the Global Institute of Sustainability; Jim Holway continued as the campus coordinator for ASU. Linda Williams very ably covered the ASU business activities including supporting the two AD's and several complicated contracts. Jim received support for most of the past year from Jina Olbinski.
- NAU has an AWI office that is supported by Melody Bowling and Kimberly Everidge, with Abe Springer and Paul Gremillion serving as co-coordinators. NAU has been exceptionally supportive of all AWI activities and very engaged in our work and sees a future for some water coordination activities after AWI ceases operations.

D. Associate Directors

There are now only two Associate Directors (AD), as Bennett Curry left his position as AD for Commerce in December of 2007. Chuck Graf has been in his position for two and a half years, and Placido dos Santos for about two years and a quarter.

- Chuck has been doing a yeoman's job as manager of most of our water quality projects, liaison for ADEQ, and coordinator of the salinity workshop. He is on numerous advisory boards and reviews proposals for many other organizations. He regularly helps coordinate conferences and workshops and has been assisting in fundraising and grant writing.
- Placido is the AD for ADWR, and has worked hard to engage ADWR in AWI activities. He initiated a new Water Table for the Arizona Mexico Commission at ADWR's request and is now the lead Arizona coordinator for the Arizona-Sonora Bi-national Institute for Water and Renewable Energy. He coordinated and led a very successful bilingual field trip co-sponsored by AWI to the lower Colorado and Delta area and has developed the US-Mexico training program funded by Christy Walton. He is managing several AWI projects. He also participates in reviewing research proposals for outside entities and has been invited to Washington DC twice in the last year to provide input to EPA. He has also participated in multiple bi-national conferences.

E. Other

We spent much time this year unsuccessfully trying to reach a comprehensive agreement about the IDC rate for AWI projects and developing a unified and simplified joint contracting process across the universities.

VI. Funding and Fundraising

- This year, the Board of Regents provided \$100,000 to support central office activities.
- The Arizona Legislature provided \$1.08 million to support AWI activities on the three campuses for FY 2008-2009. Due to the budget cut in 2008, we were operating at 10% lower levels (and now are in shut-down mode, so roughly half this amount will be returned on each campus).



- Our fundraising activities were curtailed this year due to administrative issues in our office. We did receive checks from APS, City of Phoenix, Salt River Project, Global Water, and Tucson Electric/Unisource, the City of Scottsdale, AWPCA and the National Water Research Institute. The donations received in 2008–2009 totaled \$89,050.
- Over the past three years, we have received support from several sources at the UA to support AHIS, including a 2007 TRIF grant of \$100,000 through SAHRA to support a programmer and the new informatics position, \$75,000 to support the new informatics position through IE, and \$45,000 from Biosphere 2 for the informatics position, derived from a Science Foundation Arizona grant. Funding at ASU for one grad student came from the Decision Center for a Desert City and a \$150,000 grant came from the Arizona Community Foundation.
- Although we have not finalized the agreement yet with Reclamation, they are currently processing a \$457,332 renewal on our “Enhancing Water Supply Reliability on the Colorado River” grant. The contract for this renewal has been in negotiation for 9 months.
- Two NSF grants submitted during 2007 were turned down but received generally positive reviews. They will be modified for resubmission by Matthew Garcia during 2009–2010.
- AWI has also obtained significant research funding for our projects from outside collaborators.
- We requested earmark funding for the Casa Grande Water Recycling Project through the Energy and Water Development and Related Agencies Appropriations Act of 2009, and were awarded \$54,000 via the Inland Waterways Trust Fund. This funding is to support water recycling technology evaluation and development for the 100% recycling at the Frito Lay Casa Grande Plant.
- Total funded activity for AWI since its inception, including direct funding, cash matching, and in-kind contributions, was \$4.2 million. The total cash flow to the three universities from the Arizona legislature and the Arizona Board of Regents was \$4.43 million.

2008 AWI Funded Project Summary (2/20/08)

2008 Project	Non-University Partners**	Expected Outcomes	Status	Benefits to Arizona's Citizens
<p><u>1. Enhancing Sustainable Water Reclamation Using Algae-Based Biotechnology</u></p> <p>Investigators (Principal Invest. in bold): Baxter (NAU); Hu, Sommerfield (ASU)</p>	Phoenix	Perform research to integrate algae-based biotechnology into sewage treatment processes for bioenergy production, carbon dioxide sequestration, and dissolved solids reduction.	Selected for Funding	Promotes enhanced energy production potential of sewage treatment plants, reduced energy use and carbon footprint, and improved quality of treated wastewater available for beneficial reuse.
<p><u>2. Evaluating Proposed Operational Practices for Control of Naegleria fowleri in AZ's Public Drinking Water Systems</u></p> <p>PI: Brown, Rittmann, Abbaszadegan (ASU); Gerba (UA)</p>	Peoria, Tucson, Mesa, Chandler	Evaluate operational practices in public drinking water systems to ensure that the deadly amoeba, <i>Naegleria fowleri</i> , if present in the source water, is controlled and will not pose a threat to human health.	Selected for Funding	Protection of drinking water supplied by public drinking water systems.
<p><u>3. Reverse Osmosis Pretreatment Using Ion Exchange Brine Recycle and Selective Precipitation</u></p> <p>PI: Ela, Arnold (UA); Ketterer (NAU)</p>		Characterization of a novel pretreatment approach that could greatly increase the effectiveness and reduce brine wastewater volumes in the RO treatment of CAP water.	Selected for Funding	Enhance the feasibility of large-scale treatment of CAP water to augment the water supply in Tucson and elsewhere.
<p><u>4. Arizona's Agricultural Economy - Future Scenarios and Water Management Implications</u></p> <p>PI: Frisvold (UA); Aggarwal, Patterson, Acharya, Molina (ASU)</p>	Agri-Business Council of Arizona	Hold six listening sessions with key agricultural stakeholders to determine their vision for the future of agriculture in AZ. Based on this input, develop 3-5 future scenarios for agriculture and evaluate their water management implications, both medium-term (to 2020) and long-term (2020-2050).	Selected for Funding	This project analyzes future scenarios for agriculture as a first step to allow policy makers to consider water needs in Arizona, to avoid unintended disruptions to agricultural economies and rural communities and to evaluate different criteria for any potential water transfers.
<p><u>5. On-Site Microbial Monitoring of Water by Electrokinetic Lab-On-A-Chip</u></p> <p>PI: Islam, Porter (NAU); Chae (ASU)</p>		This project combines in a unique way two emerging technologies (microfluidics and microcantilever sensors) that could lead to the development of real-time instruments for detecting and quantifying dangerous chemicals and pathogenic organisms.	Selected for Funding	Technologies for real-time detection of dangerous chemicals and pathogenic organisms are critically needed in the drinking water and wastewater treatment industries and for homeland security purposes. This project has very high commercialization potential.
<p><u>6. Impacts of Forest Thinning on Water Balance</u></p> <p>PI: Kolb, Montes-Helu, Flikkema (NAU); Breshears (UA)</p>	NSF, USDA	Builds on ongoing work by evaluating new concepts for modeling evapotranspiration (ET) in ponderosa pine forests undergoing thinning. A new approach using wireless, compact, distributed data-logging sensors will be used to provide ET data.	Selected for Funding	Thinning is often promoted to reduce forest fire hazard and increase surface water yield in ponderosa pine forests. ET is a key factor in estimating runoff and water yield for thinned plots. This project will help evaluate the water and related benefits of forest thinning.

2008 AWI Funded Project Summary (2/20/08)

<p><u>7. Arizona Hydrological Information Portal - A Collaborative Web Environment for the AHIS</u></p> <p>PI: Otte (NAU); Gries, Aguilar (ASU); McGill (UA); Abraham (Klienfelder)</p>	<p>Klienfelder</p>	<p>This project will integrate recently completed components of the Arizona Hydrological Information System (AHIS) into a single user-accessible and user-friendly Web portal through which users will be able to easily and efficiently manage and share data.</p>	<p>Selected for Funding</p>	<p>The Web portal will allow state agencies, researchers, private industry, and the general public easy Internet access to a wealth of cross-agency water data in AZ and aids AHIS in becoming the electronic clearinghouse for user-friendly access to water data in Arizona.</p>
<p><u>8. Status of Generation, Reuse and Recharge of Treated Wastewater in AZ: Evaluation of Programs, Data Sources and Utilization Opportunities</u></p> <p>PI: Rock, Uhlman, Eden, Westfall (UA); Fox, Stromberg, White (ASU); Solop, Newell (NAU)</p>	<p>ADEQ, ADWR, USBR</p>	<p>Identify and compile data on reclaimed water and its reuse/recharge from ADWR, ADEQ, and other sources. Based on the data compilation, the current status of reuse/recharge and state regulatory programs governing those activities will be evaluated, and further opportunities for more widespread and efficient reuse will be identified.</p>	<p>Selected for Funding</p>	<p>Project will provide a better understanding of the extent of reuse/recharge in Arizona, how this source of water compares to other sources of supply (groundwater, surface water, CAP water), and opportunities for promoting additional utilization.</p>
<p><u>9. Water and Energy Sustainability with Rapid Growth in the Arizona-Sonora Border Region</u></p> <p>PI: Scott, Varady, Garfin (UA); Pasqualetti, Guhathakurta (ASU)</p>		<p>This project will 1) map spatial patterns of population growth and economic drivers in the rapidly growing Arizona-Mexico border region, 2) quantify current and future energy and water requirements, 3) assess future energy and water sustainability including impact of climate change, and 4) evaluate alternative management scenarios.</p>	<p>Selected for Funding</p>	<p>Water and energy demands are inextricably linked at the Mexican border and need to be evaluated from a combined management perspective. Information on projected energy or water shortfalls identified in this study will assist Arizona and Sonora in developing sustainable energy/water strategies.</p>
<p><u>10. Sensitivity Analysis of Arizona State Drought Status Determination</u></p> <p>*PI: Selover (ASU); Crimmins, Garfin (UA); Craig (ADWR)</p>	<p>ADWR</p>	<p>Drought status in AZ is currently determined using set of subjective weighting factors for various drought indicators (e.g., rainfall and streamflow). This project will analyze the drought indicators and weighting factors, develop optimal calculation methodologies and weightings, and test against historical records for prediction accuracy.</p>	<p>Selected for Funding</p>	<p>Portrayal of drought status to affected parties, government officials, and the general public needs to be as accurate as possible. This project will provide a better scientific basis for determining drought status in Arizona, which in turn will allow more appropriate and effective drought mitigation strategies to be implemented.</p>
<p><u>11. Verde River Ecological Flows Study Phase II: Integrated Research for Refining Flow-Ecology Response Models</u></p> <p>PI: Stromberg, Schmeekle (ASU); Springer (NAU); Meixner, Reinthal (UA)</p>	<p>The Nature Conservancy</p>	<p>One of the products of the first phase of this study (2007 AWI Project #4) was a consensus research agenda for determining the ecological response to hydrologic variation in the Verde River. This 2008 study begins implementing the research agenda, including integrated data collection (floodplain characteristics, riparian vegetation, fish and fish habitat-flow relationships, groundwater levels, etc.) and further development of the flow-ecology response model.</p>	<p>Selected for Funding</p>	<p>In the upper Verde River, increased groundwater pumping will cause conflicts between human and ecosystem needs due to resulting flow decreases to the river. The aim of this project is to better define the water requirements needed to maintain the ecologic characteristics of the Verde River system (fish, riparian plants, etc.). The information gained is essential to devise approaches to sustain the Verde River ecosystem as water demand grows.</p>

2008 AWI Funded Project Summary (2/20/08)

<p><u>12. Hydroclimate Management Capacity Building and Watershed-Based Precipitation Runoff Modeling in the Navajo Nation</u></p> <p>PI: Tecle, Anderson, Cobb, Heinrich (NAU); Garfin, Crimmins (UA); Leeper, Tallsalt-Robertson (Navajo Nation)</p>	<p>Navajo Nation Dept of Water Resources</p>	<p>This project follows up on findings of a 2007 AWI-funded project (#5) on the Navajo Nation by 1) developing manpower and building capacity in hydroclimatic science and instrumentation management and 2) modeling watershed-scale rain–runoff relationships.</p>	<p>Selected for Funding</p>	<p>This project will help the Navajo Nation acquire reliable information on water yield and stream flood flows for economic development, flood and drought forecasting and management, and hydraulic structural design and ecosystem maintenance. All of this information will help provide a better quality of life in tribal communities.</p>
<p><u>13. Operation of the Activated Sludge Process for Removal of Estrogenic Activity During Conventional Wastewater Treatment</u></p> <p>PI: Quanrud, Saez (UA); Propper, Vail, Ingram (NAU)</p>		<p>Continues research from a 2007 AWI-funded project (#6) by using bench-scale methods to determine the effectiveness of specific unit sewage treatment processes to remove endocrine disrupting chemicals (EDCs) from treated wastewater. The project also supports continued development of a rapid immuno-based sensor to detect key estrogenic compounds.</p>	<p>Selected for Funding</p>	<p>Promotes safe and effective reuse of reclaimed water in Arizona by identifying the specific sewage treatment plant processes and operational methods that will most effectively remove EDCs from treated wastewater. The sensor, which has great commercialization potential, will make analysis of key estrogenic compounds simpler, faster, and cheaper.</p>
<p><u>14. A Best Practices Guide for Rural Water/Energy Usage in Arizona</u></p> <p>PI: S. Mead, Schlinger, Auberle, J. Mead (NAU); Casavant (UA); Sejkora (AZ State Parks)</p>	<p>Az State Parks</p>	<p>Develop a best practices guide for rural communities to conserve water, reduce energy usage, and minimize greenhouse gas emissions in the management and operation of their water and wastewater infrastructure.</p>	<p>Selected for Funding</p>	<p>Rural communities operating water treatment/distribution and wastewater collection/treatment systems generally do not have the personnel and expertise to help them “green” their infrastructure. The best practices guide from this project will fill that gap and benefit the communities from both economic and environmental standpoints.</p>
<p><u>15. Developing a Methodology for Identifying and Prioritizing At-Risk Water Resources for the Coconino Plateau</u></p> <p>PI: Springer, Stevens, Manone (NAU); Hogan (UA)</p>		<p>The project will (1) convene a workshop of experts in scientific, cultural, historical, and water law fields to identify Coconino Plateau’s most important hydrologic features, (2) compile existing information about “at-risk” water resources at these sites, (3) conduct site visits to fill in basic data gaps, and (4) develop a prioritization scheme and prioritize areas.</p>	<p>Selected for Funding</p>	<p>By identifying at-risk water sources on the Colorado Plateau, an opportunity exists to prioritize these sources for management and protection as needed. The methodology will be published and disseminated for use by other watershed groups throughout Arizona to ensure that at-risk water are properly identified and prioritized.</p>

*Public and private investment: AWI grant amount [left column]; partner cash and in-kind contributions by universities (non-AWI), public agencies, non-governmental organizations and private sector entities [middle column]; and total investment [right column]

**Non-university public or private partners contributing cash or in-kind services to the project. (AWI appreciates substantial cash and in-kind service contributions by one or more of the universities for many of the projects, but has not separately listed those university partners in this column)

**ARIZONA WATER INSTITUTE (AWI)
FY05 - FY09 ACTUAL**

	FY 2005 Actual (*)	FY 2006 Actual (**)	FY 2007 Actual	FY 2008 Actual	FY 2009 Budget***	FY 2009 Actual
REVENUE						
Carry Forward \$	- \$	- \$	57,951 \$	48,987 \$	57,891 \$	57,891
NEW TRIF Revenue \$	37,500 \$	150,000 \$	200,000 \$	200,000 \$	100,000 \$	100,000
Total Revenue \$	37,500 \$	150,000 \$	257,951 \$	248,987 \$	157,891 \$	157,891
EXPENDITURES						
Personnel Services \$	- \$	82,894 \$	192,312 \$	181,080 \$	157,891 \$	150,536
Other Operating \$	37,500 \$	9,156 \$	16,652 \$	10,016 \$	- \$	6,932
Total Expenditures \$	37,500 \$	92,049 \$	208,964 \$	191,096 \$	157,891 \$	157,468

* FY 2005 TRIF funds were allocated to Arizona Department of Commerce (not to AWI) to fund development of AWI business plan by Battelle Institute.

Director and Administrative Associate.

***ABOR funds will be supplemented with funds from other sources to pay the Director's and Admin Support salaries and operating costs for FY 2009



ABOR CENTRAL OFFICE
TECHNOLOGY AND RESEARCH INITIATIVE FUND (TRIF)
FY 2009 ACTUAL / FY 2010 BUDGET
REGENTS INNOVATION FUND
Arizona Water Institute (AWI)

	<i>FY 2009 REV BUDGET</i>	<i>FY 2009 ACTUAL</i>	<i>FY 2010 BUDGET</i>
REVENUE			
Carry Forward	\$ -	\$ -	\$ -
TRIF Revenue	100,000	100,000	-
TOTAL REVENUE	<u>\$ 100,000</u>	<u>\$ 100,000</u>	<u>\$ -</u>
EXPENDITURES			
OPERATING BUDGET			
Personal Services	\$ -	\$ -	\$ -
ERE	-	-	-
All Other Operating	-	-	-
Subtotal Operating Budget	<u>-</u>	<u>-</u>	<u>-</u>
GRANTS/PROJECTS:			
The University of Arizona	100,000	100,000	-
Subtotal Grants/Projects	<u>100,000</u>	<u>100,000</u>	<u>-</u>
EXPENDITURES GRAND TOTAL	<u>\$ 100,000</u>	<u>\$ 100,000</u>	<u>\$ -</u>