

WATER AND ENVIRONMENTAL SUSTAINABILITY



Arizona's First University.

September 1, 2009



Arizona's natural resources, most critically its water supplies, are crucial to the state's economy and to the health and well-being of its residents. The most pressing environmental issues of our time are especially apparent in arid and semi-arid regions of the globe where population growth is most rapid and life-supporting resources are most limited. As the leading university in the world with expertise in water, as well as being in the forefront with regard to interdisciplinary work in the earth sciences and environmental studies, the

University of Arizona's Water & Environmental Sustainability Program (WESP) is uniquely positioned to use its strengths to support university, industry, and government collaborations in research, technology, education, and outreach to resolve water and environmental resource challenges. The mission of the WESP is to provide science-based technical, economic, legal, and policy expertise, necessary for water and environmental sustainability in Arizona and other semi-arid regions facing increasing demands on natural resources and the uncertainties of environmental change. It is anticipated that the knowledge and techniques generated will have world-wide applications that will stimulate the economy and produce far-reaching societal benefits.

Together, the two components of WESP, the Water Sustainability Program (WSP) and the Translational Environmental Research (TER) initiative will create synergies for UA to be a world leader in interdisciplinary, cutting-edge water and environmental research and in applying results to resolve resource challenges at the state, national, and international level.

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Sharon Megdal, Ph.D.
Director, Water and Environmental
Sustainability Program
and
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PERFORMANCE MEASURES

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT													
Sponsored Awards: (\$M) ¹	\$ 1.9	\$ 2.6	\$ 2.4	\$ 3.4	\$ 3.33	\$ 12.2	\$ 10.51	\$ 15.2	\$ 14.7	\$ 11.8	\$ 20.0	\$ 12.8	\$ 13.8
Gifts & Other Sources (\$M)	\$ 0.00	\$ 0.012	\$ 0.014	\$ 0.042	\$ 0.09	\$ 0.00	\$ 0.087	\$ 0.085	\$ 4.650	\$ 0.09	\$ 3.8	\$ 0.095	\$ 0.10
TECHNOLOGY TRANSFER & COLLABORATIONS													
Licenses & Options ²							1	1	0	2	0	0	0
Patent Applications ³				4	4	3	3	2	1	2	1	1	1
WORKFORCE CONTRIBUTIONS													
Number of Graduate Students Enrolled ⁴						10	28	38	33	38	39	38	48
Undergraduate Trainees ⁵	0	9	22	40	40	42	52	43	64	43	74	56	56
Graduate Trainees ⁶	1	16	54	75	89	85	68	95	98	95	77	59	59
Postdoctoral Trainees ⁷	2	2	3	3	3	4	8	7	6	7	5	5	5
New Faculty Hires	1	0	1	1	4	9	9	2	3	2	3	2	2
CURRICULUM INNOVATIONS & STUDENTS SERVED													
Number of Newly Revised Courses Offered ⁸						1	1	1	1	1	2	1	1
OUTREACH & EDUCATION													
Teachers/Educators Trained ⁹	0	524	880	1,032	997	950	1,130	979	740	1,008	1,755	1,035	1,070
K-12 Students Benefiting & Participating ¹⁰	0	26,890	29,530	34,745	39,270	29,500	36,182	30,600	32,120	31,700	34,454	32,800	33,900
Communities Assisted						5	7	10	9	10	12	10	10
Workshops, Seminars, & Conferences Supported ¹¹	1	1	1	1	2	4	5	6	13	6	15	11	11

¹ Total FY08 onward reflects combined total of Translational Environmental Research Initiative that began Jan/07 and the Water Sustainability Program awards previously broken out under Government Grants Received and Additional Funding Obtained. Awards to water centers retroactively added to Actuals prior to FY07. Merged metrics for Translational Environmental Research include Federal Grants received; Private Foundation/Gifts; Other Sources; and Training Grants.

² New metric from Translational Environmental Research initiative.

³ Patent Applications was previously labeled Patent Applications in Process.

⁴ Refers to graduate students enrolled in interdisciplinary environmental studies/earth sciences programs and the Graduate Water Policy Certificate program.

⁵ Previously labeled Undergraduate Employment/Research Opportunities; includes undergraduate students working on water related TRIF funded research projects, internships, and fellowships.

⁶ Previously labeled Graduate Employment/Research Opportunities; includes graduate students working on water related TRIF funded research projects, internships, and fellowships

⁷ Previously labeled Postgraduate Employment/Research opportunities; includes postdoctoral candidates working on water related TRIF funded research projects

⁸ Number of Newly Revised Courses Offered was formerly called New Water Related University Courses/Certificates/Degrees.

⁹ Teachers/Educators Trained FY08 forward includes previous metrics Teachers Trained, Facilitators Trained, and Teachers involved in outreach activities related to water education.

¹⁰ FY08 forward includes previous K-12 Students benefiting (in classrooms) metric, as well as K-12 Students Participating in Water Festivals, and K-12 Students participating in outreach activities (non-formal settings) metric.

¹¹ Workshops, Seminars & Conferences Supported, FY07 forward, is a combination of WSP and TER initiatives.

* Industry collaborators/Private sector collaborations/Public sector collaborations; Interdisciplinary curriculum modules developed; Communities participating in K-12 outreach activities; Publications produced; Other knowledge transfer products; and Presentations/exhibits metrics were discontinued.

PERFORMANCE ANALYSIS

Return on Investment (ROI): WESP centers, programs and projects are expected to receive sponsored awards and gifts from federal, state and county agencies, municipalities and the private sector, in excess of \$10M/per year through FY2011. These funds provide an ROI of greater than 2:1 on the TRIF investment in water and the environment.

Technology Transfer & Industry Collaboration: WESP researchers work to develop and commercialize real world sustainable technologies, measured by licenses and options and patent applications facilitated by the UA Office of Technology Transfer.

Workforce Contributions. Undergraduate, graduate and post-doctoral students gain invaluable experience and career training through employment, assistantships, fellowships and internships. The Interdisciplinary Environmental Studies and Earth Sciences and Water Policy Certificate programs prepare motivated graduate students in specialized areas. New faculty hires help to strengthen UA's ability to tackle complex state water and environmental problems, train students, and compete for new research funds.

Curriculum Innovations: Each year WESP faculty develop new interdisciplinary course offerings to address pressing challenges in water and environmental resources.

Outreach & Education: Over 30,000 K-12 students and more than 700 teachers per year benefit from high quality water education programs across the state. Many workshops, seminars and conferences provide valuable means to disseminate knowledge to decision makers, professionals and the public. Arizona

communities across the state benefit from tailored water management assistance.

GOALS

WESP's goal is to strengthen research, education, and outreach efforts in water and environmental sustainability at the University of Arizona to enhance economic development and the quality of life for all of Arizona.

WESP is leveraging its strengths in academia, research, and environmental technology to create several outcomes that include:

- practical education for grades K-12 to create general awareness of issues, problems, and career-related training;
- internationally recognized research and technology transfer initiatives;
- a thriving industry cluster, which includes both private sector and public sector entities, supported by a skilled workforce that is educated at the University of Arizona; and
- stronger relationships across disciplines within the University of Arizona, which will result in research innovations to create new business initiatives.

These efforts build on the extensive expertise in water resources and environmental and earth science by over 300 UA faculty and staff in 10 colleges and 60 departments and help to promote UA as a national



Jonathan Overpeck, Ph.D.
Director, Translational
Environmental Research

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE											
Carry Forward	\$ -	\$ 442,080	\$ 95,320	\$ 437,798	\$ 595,950	\$ 689,983	\$ 1,861,545	\$ 853,293	\$ 853,293	\$ (53,628)	\$ -
New TRIF Revenue	\$ 474,283	\$ 480,352	\$ 2,009,566	\$ 2,460,948	\$ 3,907,500	\$ 4,645,467	\$ 3,993,114	\$ 4,296,816	\$ 3,360,110	\$ 3,283,206	\$ 3,283,205
TOTAL REVENUE	\$ 474,283	\$ 922,432	\$ 2,104,886	\$ 2,898,746	\$ 4,503,450	\$ 5,335,450	\$ 5,854,659	\$ 5,150,109	\$ 4,213,403	\$ 3,229,577	\$ 3,283,205
EXPENDITURES											
Personal Services	\$ 28,757	\$ 502,244	\$ 1,135,364	\$ 1,585,695	\$ 1,917,386	\$ 2,447,059	\$ 3,219,837	\$ 4,642,826	\$ 2,864,775	\$ 2,810,133	\$ 2,863,761
All Other Operating Expenses	\$ 3,446	\$ 324,868	\$ 531,724	\$ 717,101	\$ 1,336,400	\$ 1,026,846	\$ 1,751,464	\$ 507,283	\$ 1,407,349	\$ 419,444	\$ 419,444
Capital	\$ -	\$ -	\$ -	\$ -	\$ 559,681	\$ -	\$ 30,065	\$ -	\$ (5,093)	\$ -	\$ -
TOTAL EXPENDITURES	\$ 32,203	\$ 827,112	\$ 1,667,088	\$ 2,302,796	\$ 3,813,467	\$ 3,473,905	\$ 5,001,366	\$ 5,150,109	\$ 4,267,031	\$ 3,229,577	\$ 3,283,205
Return on Investment	-	2.2:1	1.2:1	1.5:1	0.9:1	3.0:1	3.8:1	2.3:1	5.6:1	4.0:1	4.2:1:1

Notes:

- 1) Return on Investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by Arizona Board of Regents in March 2007, which is different from the ROI methodology used to calculate ROI in FY 2002-2006.
- 2) Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.



and global leader in research and technology development.

WESP pursues its goals and objectives through strategic recruitment and research initiatives; student fellowships and internships; education and outreach programs; and the activities of the individual centers.

MANAGEMENT

Sharon Megdal serves as the Director of the Water and Environmental Sustainability Program (WESP) and the Water Sustainability Program (WSP). Jonathan Overpeck and Diana Liverman are Co-Directors of Translational Environmental Research (TER).

LEARN MORE

- Contact Dr. Sharon Megdal, WESP and WSP Director, smegdal@cals.arizona.edu or 520-792-9591 X21. Visit the WSP website at: www.wsp.arizona.edu
- Contact Dr. Jonathan Overpeck, TER Director, jto@email.arizona.edu or 520-622-9065; Dr. Diana Liverman, TER Co-Director, liverman@u.arizona.edu or 520-626-2910
Visit the TER website at: www.ispe.arizona.edu/resources/research/ter/about.html
- Contact Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, at tolbert@email.arizona.edu or 520-621-3513

WATER SUSTAINABILITY PROGRAM EXECUTIVE COMMITTEE

Sharon Megdal, Director, WSP and Water Resources Research Center

Raina Maier, Associate Director, NIEHS Superfund Research Program

Ian Pepper, Director, NSF Water & Environmental Technology Center

Farhang Shadman, Director, SRC/Sematech Engineering Research Center for Environmentally Benign Semiconductor Manufacturing

Juan Valdes, Director, NSF Center for Sustainability of semi-Arid Hydrology and Riparian Areas

TRANSLATIONAL ENVIRONMENTAL RESEARCH

Jonathan Overpeck, Co-Director TER and the Institute of the Environment

Diana Liverman, Co-Director TER and the Institute of the Environment

Barbara Morehouse, Deputy Director of Research

Gregg Garfin, Deputy Director of Outreach

ADVISORY BOARDS

The Water Sustainability Program and Translational Environmental Research initiative have independent advisory committees/boards. Each has an academic advisory committee and an external advisory committee. Two members of each external advisory committee represent TER and WSP on the WESP External Advisory Board.

