

# ASCE Assessment: Water Infrastructure Needs Attention

Mary Black – SAHRA, University of Arizona

Approximately every two years, the American Society of Civil Engineers (ASCE) assesses the condition of 15 categories of the nation's infrastructure in its *Report Card for America's Infrastructure*. The 2005 report assigned poor grades in all three water-related categories applicable to the Southwest: dams (D), wastewater (D-), and drinking water (D-). These grades were as bad or worse than similar assessments in 2001 and 1998. They were based on condition and capacity, and funding versus need; they were also weighted for problems that could lead to catastrophic and deadly failure, such as collapse of a dam. For comparison, none of the infrastructure categories fared particularly well; the highest grade assigned in any category was C+ for solid waste, but D- was the lowest grade, only assigned to categories related to water.

The states of Arizona, California, Nevada, New Mexico, and Texas all included a water category in their top three infrastructure concerns. Rankings are summarized in the table at bottom.

ASCE's report was the work of a panel of 23 leading civil engineers, who "analyzed hundreds of studies, reports and other sources, and surveyed more than 2,000 engineers to determine what was happening in the field." Around one-third of the panelists were from western states. Five were from academia, eight from public or governmental agencies, and 10 from the private sector.

Regional report cards were also solicited from ASCE regions and branches, and included as addenda to the national report.

From the Southwest, report cards were received from Texas (2004), San Diego County (2004), Los Angeles County (2005), and Orange County (2002). These regional reports were compiled by local panels of civil engineers and generally assigned higher grades in more water categories, but defined risks more clearly than the national report.

The regional reports that created new categories generally reflected a particular concern in that area. Texas, for instance, assigned itself a D- for flood control, noting that Texas led all states in flood

	Deficient dams*	High-hazard dams**	Rehab cost (\$ million)***
Arizona	38	91	\$64
California	44	336	\$679
Nevada	58	134	\$30.2
New Mexico	61	164	\$152.9
Texas	113	857	\$667
Nationwide	>3,500	10,213	>\$30 billion

\* "deficiency" is defined by the state, but applies to dams considered to be unsafe and susceptible to failure

\*\* dams whose failure would cause loss of life and significant property damage; does not mean dam is necessarily deficient

\*\*\* from a study by the Association of State Dam Safety Officials

#### Dam conditions in southwestern states

claims (prior to Hurricane Katrina), but had no statewide floodplain management plan and did not fund flood control infrastructure except through low-interest loans and small grants. Los Angeles and Orange counties both added a category for urban runoff—assigning a D in both cases—with LA. County saying urban runoff poses "major water quality problems," though experts widely disagree on the funding needed to address it.

Orange County cited a continued need for a regional, watershed-based, multi-agency planning effort on this subject.

#### Dams: Overall Grade D

Nationally, the number of unsafe dams has risen 33 percent since 1998. Most concerns focus on nonfederal dams that pose direct risk to human life, which will require \$10.1 billion over the next 12 years to completely repair or replace. The report cites insufficient funding and qualified staff as major problems with respect to dam maintenance, inspection, and safety. Only 5 percent of the nation's 79,000 dams are regulated by federal agencies; state programs regulate the rest. Dam statistics for the Southwest are summarized at left.

D  
needs work!

Specific policy recommendations by the national panel included:

- establishment of comprehensive dam safety programs in all states
- creation of a loan fund for the most critical non-federal dams needing repair, maintenance, or replacement
- full funding for the Small Watershed Rehabilitation Act
- reauthorization of the National Dam Safety Program Act

Dams were also of special concern to the Texas regional panel, which assigned a grade of D- for the category. Panelists stressed that most of the state's high-hazard dams do not have regular inspections or maintenance.

#### Drinking Water: D-

Nationally, ASCE's evaluation of drinking water infrastructure

D-  
you can do better

	ARIZONA		CALIFORNIA		NEVADA		NEW MEXICO		TEXAS	
	2003	2005	2003	2005	2003	2005	2003	2005	2003	2005
#1	Roads	Roads	Roads	Roads	Drinking Water	Roads	Drinking Water	Roads	Roads	Roads
#2	Drinking Water	Drinking Water	Drinking Water	Schools	Roads	Drinking Water	Roads	Schools	Drinking Water	Wastewater
#3	Schools	Mass Transit	Schools	Wastewater	Schools	Mass Transit	Schools	Drinking Water	Waterways	Mass Transit

Top infrastructure concerns in southwestern states.

Source: Surveys of state civil engineers, conducted in Aug. 2003 (for 2003 report) and Dec. 2004 (for 2005 report)

needs was based on data collected in 1999 by the U.S. Environmental Protection Agency. Additional data collected by EPA in 2003 show significant increases to forecasted needs in the southwestern states except for New Mexico (see table at right). Arizona showed the greatest increase in needs, jumping in national ranking from 27 to 10. California and Texas have the greatest drinking water infrastructure needs in the nation, together constituting 21 percent of the nation's projected need. ASCE's report estimated that less than 10 percent (\$850 million) of the \$11 billion currently needed to maintain or replace drinking water facilities and comply with federal regulations was budgeted for 2005; this same amount is proposed for 2006.

The good news in this category is that despite the poor grade, drinking water has fallen as a top 3 concern in every western state but Arizona since the 2003 report (see table, below left). Arizona's concerns are likely due to Colorado River allocation issues in light of recent droughts.

Regional panelists expressed less worry than the national panelists in this category. San Diego County assigned a grade of B to the county's supply, treatment, and distribution of drinking water; Los Angeles County gave a C+ to its drinking water infrastructure, mainly citing a need to replace the aging distribution system; and Orange County assigned a B in the category of water, which included drinking water supply and quality, although it acknowledged cuts to surplus Colorado River water supplies were looming.

### Wastewater: D-

To replace and supplement aging and ailing wastewater management systems, which discharge billions of gallons of sewage into surface waters each year, a national investment of \$390 billion over 20 years would be required, according to ASCE's report. However, funding for such activities was cut by the U.S. Congress in 2005, and the Bush administration has proposed for 2006 a further reduction of 33 percent. In

*See ASCE, page 35*

	Drinking Water Infrastructure*				Wastewater Infrastructure**	
	Estimated Cost (billions)		National Ranking		Estimated Cost (billions)	
	1999	2003	1999	2003	2000	1996
Arizona	\$1.62	\$9.12	27	10	\$6.2	\$2.5
California	\$17.5	\$27.9	1	2	\$14.4	\$11.5
Nevada	\$0.602	\$0.912	39	36	N/A	\$0.84
New Mexico	\$1.04	\$0.92	33	35	\$0.206	\$0.242
Texas	\$13	\$28	3	1	\$9.15	\$6.4
Nationwide	\$139	\$264			\$390	N/A

\*Sources: • EPA, 2003 Drinking Water Infrastructure Needs Survey and Assessment, Third Report to Congress, 2005, <http://www.epa.gov/safewater/needssurvey/>  
• EPA, 1999 Drinking Water Infrastructure Needs Survey and Assessment, Second Report to Congress, 2001, <http://www.epa.gov/safewater/needssurvey/needssurvey.html>

\*\*Sources: • EPA, Clean Water Needs Survey 2000 Report to Congress, 2003, <http://www.epa.gov/owm/mtb/cwns/>  
• EPA, Clean Watershed Needs Survey 1996 Report to Congress, <http://www.epa.gov/owm/mtb/cwns/1996rtc/toc.htm>

### Drinking water/wastewater infrastructure needs for the next 20 years

**SAFE YIELD STUDIES**      **ARTIFICIAL RECHARGE**      **GROUND WATER MANAGEMENT**

**LITIGATION SUPPORT**      **WELLS**      **MODELING**

**GEOSCIENCE**      **Ground Water Hydrologists**

Dr. Dennis E. Williams  
(Founder and President)

**GEOSCIENCE Support Services, Inc.**  
www.gssiwater.com  
P.O. Box 220, Claremont, CA 91711 / Tel: (909) 920-0707 / Fax: (909) 920-0403  
E-mail: email@geoscience-water.com

**Stewart Brothers**  
**DRILLING CO.**

Providing Quality  
Drilling Services  
Since 1945

Services Include:  
•Water Exploration  
•Mud Rotary  
•Air Rotary  
•Packer Testing  
•Coring  
•Mineral Exploration  
•Environmental

Stewart Brothers Drilling Company  
P.O. Box 2007  
306 Airport Road  
Milan, New Mexico 87021  
(505) 287-2986  
<http://www.stewartbrothers.com>

ASCE, continued from page 19

the Southwest, ASCE's statistics show wastewater infrastructure needs increasing in Arizona, California, and Texas, but decreasing slightly in New Mexico.

Regional boards were generally more sanguine about wastewater infrastructure than the national group. The Texas regional panel assigned its state a grade of C- in this category, noting that the wastewater infrastructure is improving in most urban centers because of large investments. San Diego County assigned itself a B, while acknowledging that collection systems are in poor physical condition. Los Angeles County gave its wastewater system a B, citing the generally good condition of the area's sewers, pump stations, and treatment plants. Orange County rated itself a C+ in this category, acknowledging stresses to the sewer pipeline collection system and noting that all treatment plants in the county are owned and managed by special districts.

### **Call for a Trust Fund**

ASCE's national panelists strongly advocated a significantly enhanced federal role and investment in improving the state-of-the-nation with respect to drinking water and wastewater, recommending that the government begin to reduce funding gaps by establishing a federal water infrastructure trust fund for construction and repair of water treatment plants. The report also stressed the need for the federal government to be flexible and innovative in the financing mechanisms it utilizes. Wealthier communities and those with greater economies of scale may be adequately served by loans and credit incentives, but many communities that face more economic challenges will need grants.

Additionally, ASCE supports a federal capital budget system that will ensure that both short-term and long-term drinking water and wastewater needs are addressed through an efficient process of planning, design, and construction. The report criticized the current budgetary process, which does not differentiate expenditures for current consumption from those for long-term investment.

View the full ASCE report card at [www.asce.org/reportcard/2005/index.cfm](http://www.asce.org/reportcard/2005/index.cfm).

## SOCIETY PAGE

### **ACWA Recognizes Districts' Environmental Efforts**

*from the Association of California Water Agencies*

In December, the Association of California Water Agencies (ACWA) presented its 2005 Theodore Roosevelt Environmental Awards for Excellence in Natural Resources Management. The awards were presented at ACWA's annual fall conference in San Diego.

The Roosevelt awards are given in three categories to recognize water agencies for programs that protect natural resources while meeting public needs.

In the category of projects costing \$100,000 or less, Cucamonga Valley Water District won top honors for its Kids Environmental Festival. Held for the first time in May 2004, the festival uses interactive games, activities, and programs to show students that they, too, can play a role in conserving natural resources.

Contra Costa Water District captured the award in the \$100,000 to \$1 million category for its efforts to create 17 semi-permanent wetland ponds to provide habitat for protected species such as the California red-legged frog and the tiger salamander. The project, designed to offset impacts of constructing Los Vaqueros Reservoir, also provided habitat for the San Joaquin kit fox.

In the \$1 million or more category, Santa Clara Valley Water District was honored for its Santa Clara Valley Resources Protection Collaborative. Initiated to better coordinate and clarify land-use and public works activities in the region, the program has improved resource management and reinforced the value of local agencies working together.

ACWA is a statewide association whose 440 member agencies are responsible for about 90 percent of the water delivered in California.

Visit [www.acwa.com](http://www.acwa.com).

### **Arizona Hydrological Society Creates Charitable Foundation**

At its annual meeting last September, the Arizona Hydrological Society (AHS) voted to establish and sponsor a new charitable organization, the Arizona Hydrological Society Foundation (AHSF). Building on several years of volunteer work, the foundation was established as a separate Arizona corporation and is applying for 501(c)(3) status as a non-profit charitable organization.

AHS established the foundation to create an organization focused solely on charitable endeavors. A nine-member board of directors led by Howard Grahn, the foundation president, will oversee the fundraising, investment, and charitable activities of the group. As a 501(c)(3), the foundation will provide maximum tax advantage to donors, and it is hoped that over time the foundation will become a major force in promoting hydrology education for all age groups.

The new organization was seeded by a \$17,650 grant from AHS. The board was thrilled to receive an additional \$25,000 donation from board member Herman Bouwer, who generously shared his winnings from the 2005 Prince Sultan Bin AbdulAziz International Prize for Water. Bouwer asked only that his donation be "put to good use" by the foundation.

According to foundation bylaws, the new organization will "provide support for advancing the science, practice, and public understanding of hydrology and water resources in the semi-arid Southwest." The new board met for the first time in January to discuss the foundation's mission, goals, and immediate operational needs, and to chart a path toward assisting corporate partners in funding science and educating the next generation of scientists and the public about the unique aspects of arid and semi-arid hydrology.

For more information, contact Howard Grahn at [howard@gsanalysis.com](mailto:howard@gsanalysis.com).