The biggest state in the continental United States and its robust Green Industry face an uncertain future without new water.

BY **RON HALL** EDITOR AT LARGE

A Texas-sized water challenge

TEXAS IS on a collision course with its fresh water resources. If the state doesn't develop new sources of fresh water and convince Texans to mend their water-wasting ways, its future economic vitality is in jeopardy.

Who says? The 2007 State Water Plan, the latest in a series of reports developed every five years by the Texas Water Development Board. The plans attempt to project the state's water needs 50 years into the future.

But long before the state's economic engine stalls, the Green Industry already would've been squashed flatter than an armadillo attempting to cross Austin's I-35 during rush hour. While all other uses of water are expected to increase into the future, the plan is calling for a gradual decrease in water used for irrigation.

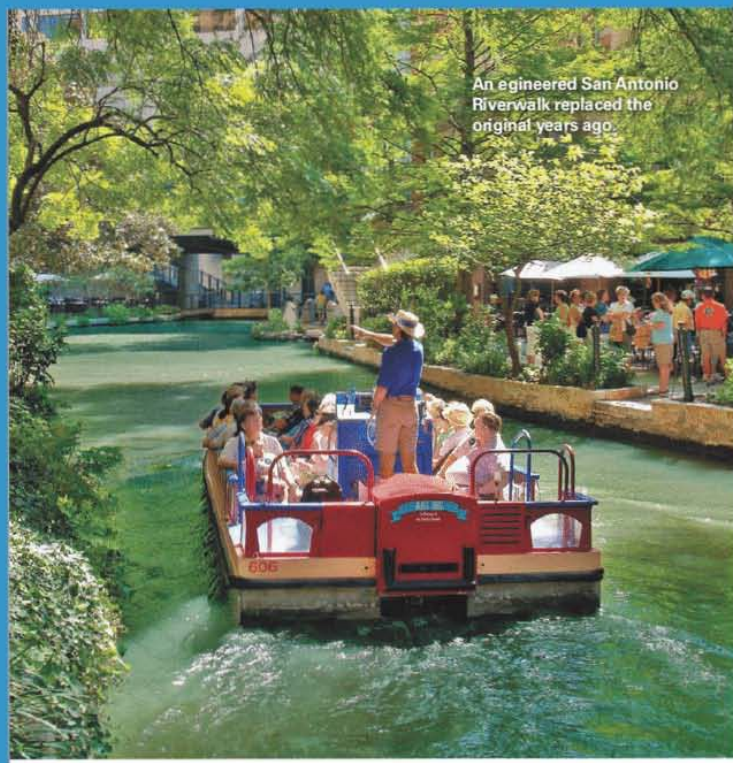
The visibility of the Green Industry's water use and the perception it's wasting water (justified in many instances) guarantee it will be one of the first industries dramatically altered or sacrificed in the name of conservation.

A Green Industry without irrigation? Yes, it could happen, says Todd Magatagan, president of the Texas Turf Irrigation Association (TTIA), a 40-year-old organization of licensed irrigators based in Plano. That's the bad news.

"Too often, the politicians have turned a blind eye on water supply and building new infrastructure and the irrigation industry is paying the price for this," says Magatagan.

The good news is it needn't happen. Apart from California or Florida, no other state in the union has a broader and deeper array of public and private agencies and entities (Green Industry associations included) focused on protecting and expanding the state's water resources. Encouragingly, many of these groups, especially industry groups, are starting to communicate. Case in point: the growing cooperation between the TTIA and the Texas Nursery & Landscape Association and also with the 10 regional irrigation associations in Texas.

ILLUSTRATION BY: CARRIE PARKHILL; SOURCE PHOTO BY: ISTOCK INTERNATIONAL INC.



An egineered San Antonio Riverwalk replaced the original years ago.

Time to act is now

Everyone in Texas, it seems, understands the stakes. But Magatagan asks, do these entities have the will and foresight to spend the money to address its water needs?

"So far, cities have been spending money on what they see as sexier projects," he says. "There's nothing more vital to our state than water."

Consider this warning from the Texas Water Development Board's 2007 State Water Plan: "If Texas does not implement new water supply projects or management strategies, then homes, businesses, and agriculture enterprises throughout the state are projected to need an additional 3.7 million acre-feet of water in 2010. By 2030, this figure rises to nearly 5.9 million acre-feet and by 2060 it increases to 8.8 million acre-feet. In 2060, slightly more than 85% of the state's population is projected to have water needs." (Note: an acre foot of water = 325,851.4 gallons.)

In light of the realization the state's future economic health is dependent upon adequate supplies of fresh water, a sense of urgency is creeping into the state's often-discussed plans to construct more lakes for surface water capture and storage and also to consider desalination plants on its Gulf Coast.

> EVERYONE IS STRUGGLING WITH WHAT'S BASICALLY A DOUBLE WHAMMY — THE ECONOMY AND THE DROUGHT
>
> — **Jerry Maldonado**, vice president of construction and commercial irrigation, Maldonado Nursery and Landscaping

Fueling that urgency, like kerosene on a bonfire, is a devastating drought, now approaching its third year, which this summer teamed up with weeks of triple-digit temperatures to hammer south central Texas. By August, 20% of the state was experiencing "extraordinary" drought, reminding some old-timers of the withering 7-year (1948-1955) "drought of record" that caused huge losses to the state's agriculture and livestock.

San Antonio in south central Texas sits at Ground Zero of the current drought. Visitors to this, the seventh largest city in the United States, cannot appreciate the severity of the drought by touring its two most popular destinations, the Alamo, the historic shrine featuring two verdant acres of grass and gardens, and its world-famous Riverwalk. Sitting at an outside cafe and watching flat-bottomed riverboats filled with tourists leisurely motoring by, one can be forgiven for not guessing the engineered waterway, snaking just below the bustling city overhead, replaced the original San Antonio River long ago.

The progressive San Antonio Water System (SAWS) provides water to more than 1.2 million customers, and aggressively protects the region's primary source of fresh water, the Edwards Aquifer. Predictably, the drought has caused SAWS to limit landscape irrigation to a single day a week.

For the most part, the Green Industry is adapting and works closely with SAWS, says Michael Brown, owner of The Grass is Greener Landscape Inc., and past president of the San Antonio Irrigation Association. San Antonio offers more than its share of challenges to the Green Industry, thanks to an incredible range of landscapes, from older designs loaded with subtropicals to more recently installed drought-tolerant xeriscapes, Brown

says. The topography of the region is just as varied.

"There are some areas in the region where you only have an inch or two of topsoil over rock," he says. "You can't grow landscapes on rock."

Hydrozoning, the concept of selecting and grouping plants with identical water needs within a landscape, is the only option when designing and installing landscapes in San Antonio, Brown says.

Jerry Maldonado, vice president of construction and commercial irrigation for Maldonado Nursery and Landscaping, says he can't remember a hotter or drier summer than the one San Antonio experienced this year. That's saying something. The company he, his two brothers and his father founded almost 25 years ago has grown through just about every condition central Texas has thrown at it.

"We've been through this before and have experienced some sort of irrigation restrictions just about every year, but never this bad," Maldonado says. "Everyone is struggling with what's basically a double whammy — the economy and the drought."

"Once-a-week watering isn't enough to save a lot of landscapes in this heat," Maldonado says. "And we're losing a lot of trees, too."

Irrigating big commercial properties is especially difficult because some of them are too big to water in one day a week, he adds.

SAWS instituted the once-a-week watering restrictions to protect the region's principal source of fresh water, the Edwards Aquifer. SAWS bases its action on the level of the aquifer, which can rise or fall rapidly depending on rainfall within the aquifer's 8,000-sq.-mile boundary. SAWS taps 92 wells to draw its water from the aquifer, although it was the aquifer-fed springs and rivers that originally drew the first settlements to the region hundreds of years ago.

The drought has shriveled demand

TEXAS RESEARCHERS INVESTIGATE 'SMART' IRRIGATION

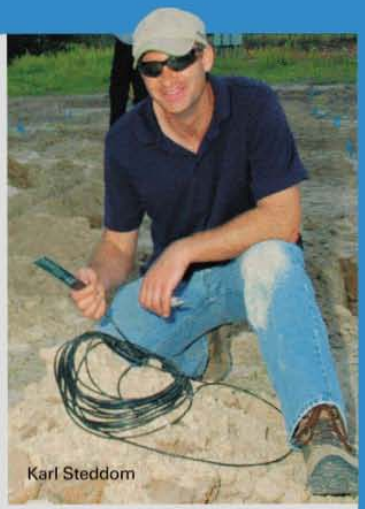
OVERTON, TX — A new study being conducted by Dr. Karl Steddom, AgriLife Extension plant pathologist, and Dr. Lloyd Nelson, ryegrass breeder with Texas AgriLife Research, compares the effectiveness of different irrigation systems using smart controllers to prevent overwatering of home lawns, athletic fields and public parks. Steddom and Nelson are conducting the study at the Texas AgriLife Research and Extension Center. The East Texas Irrigators Association is cooperating with the study.

"Water conservation is a big issue in Texas," Steddom says. "Legislation is coming that will require professional turfgrass managers — and eventually homeowners, too — to install smarter irrigation systems."

Though the study is being done in East Texas, the results should be applicable to much of the state.

"Turf irrigation demands in East Texas are highly variable," Steddom says. "Our sandy soils and intermittent rainfall patterns result in frequent fluctuations between periods

Lloyd Nelson



Karl Steddom

of low and high water demand. This makes this location an ideal or a worst case scenario to evaluate these new approaches to irrigation scheduling."

Professional landscapers and irrigation installers are some of the most important stakeholders in the research, says Todd Magatagan, president of the Texas Turf Irrigation Association and past president of the East Texas Irrigators Association. As smart controllers become used more widely, it'll be the commercial installers like Magatagan who'll need to know which products and technologies prove to be the most reliable for customers.

"We're in phase one of this project," he says. "Phase one creates a baseline, but phase two will run actual products that are on the market and give us an independent testing method where this type of intelligent controller or this one works better."

In commercial systems, the sophistication of off-the-shelf smart controllers ranges from those that try to estimate evapotranspiration to those that actually measure soil moisture.

"The number of (commercially available) smart controllers is growing every year," Magatagan says. "(At this time), we expect to be testing about a dozen smart-controller systems."

PHOTOS COURTESY: REALM

for residential irrigation systems, Maldonado says. "They figure if they can't use them, why put them in," he says.

But Maldonado's company continues to install systems on commercial sites. And even though the San Antonio market has been aware of the efficiencies of drip irrigation for landscape beds, its popularity among property owners remains much less than Maldonado wishes.

It's almost nonsensical to discuss the average weather for central Texas, says Deborah Cole of Greater Texas Landscapes (GTI), which has locations in Austin and San Antonio. This is especially true for the region's average temperature or precipitation. After all, what does average mean in a state where Beaumont, on the state's humid Gulf Coast, averages 55 in. of precipitation annually and El Paso, in the rocky West, receives 10 inches of rain?

That's a lot to ask of average in a landmass of 268,000 sq. miles and a climate that varies dramatically with 10 recognizable climate divisions, Cole says. You work with the weather Texas gives you, which can be just about anything, including drought.

"People have finally decided it's OK to have things in their landscapes other than grass and other green plants," Cole says. "For years, we've had a hard time trying to convince people to consider options other than grass. They didn't understand we weren't talking about just rocks and cactus. Now people are beginning to see we're able to do creative things with different textures and colors of material, including rocks, boulders and gravels, and the many native and adapted plants that are now readily available," Cole says.

"Actually, we've had nurseries supplying beautiful native and drought-tolerant plant material for years, thanks to the late Lady Bird Johnson and her love of wildflowers," she adds.

But, as healthy as the Green Industry remains in the state in spite of the drought, its long-term future is problematic.

If water authorities and local politicians don't address the water needs of their cities' growing populations and development, some industries will almost certainly be denied access to fresh water. First on that list could very well be irrigation for landscapes and turfgrass, says Magatagan.

Actually, he says, the stakes are much greater than that.

Heed the words of the Texas Water Development Board's "2007 Water Plan" in assessing the state's potential water shortfalls:

"Needs of this magnitude are projected to cost businesses and workers approximately $9.1 billion worth of income in 2010. By 2060, this figure increases to roughly $98.4 billion. Forgone state and local business taxes associated with lost commerce are projected to amount to $466 million in 2010 and $5.4 billion in 2060." LM

SAWS **at a glance**

The San Antonio Water System covered 620 sq. mi. and, as of the end of 2007, served 344,261 customers and had a water capacity of 899.7 mgd. Here is how that water was distributed.

CUSTOMER TYPE	NO. OF CUSTOMERS	CUSTOMER TYPE BY %	% OF WATER DEMAND
Residential	321,177	93.29%	54.92%
Commercial	18,575	5.40%	23.74%
Apartment	3,447	1.00%	15.49%
Industrial	153	0.04%	4.22%
City of San Antonio	808	0.23%	1.20%
Wholesale	7	<0.01%	0.20%
Bexar Met	1	<0.01%	<0.01%
SAWS Mtrd.	113	0.03%	0.23%

Source: San Antonio Water System

Future Texas **water needs**

Population in Texas is expected to more than double between the years 2000 and 2060 and demand for water there is expected to increase by 27%. Even so, the amount to be used for irrigation (agricultural and urban) is expected to decrease by more than 15% during the same period.

YEAR	POPULATION	TOTAL DEMAND (acre ft.)	IRRIGTION DEMAND (acre ft.)
2010	24,915,388	18,311,828	10,345,131
2020	29,117,537	19,010,876	9,980,301
2030	33,052,506	19,567,048	9,585,833
2040	36,893,267	20,104,592	9,206,620
2050	41,071,409	20,758,602	8,843,094
2060	45,588,282	21,617,274	8,559,244

Source: "Water for Texas 2007"