



One of the most-used resources in the restaurant industry is never given much thought. It's time for that to change.

# THE STATE OF OUR

# WATER

BY  
STEPHANIE  
OGBURN

**T**ake a drive through California's Central Valley, and you'll be driving through ... well, not quite the breadbasket of the U.S., but more like its salad bowl. The area's mild climate means farmers are growing something nearly year-round, be it lettuce, tomatoes, oranges, almonds, or even pomegranates. Dairy farms in the southern part of the valley round out the agricultural landscape; California produces more milk than any other state in the nation.

Your route will take you down Interstate 5, shooting through the west side of the valley, where at times you'll cross over a shimmering canal. The network of aqueducts slicing through the region are part of the Central Valley Project, which brings irrigation water to these fields, some of the most productive in the nation.

For American restaurants, one of the most important crops grown in the valley is processing tomatoes. These are the tomatoes used to make salsa, ketchup, tomato sauce, soup—pretty much any food item containing tomatoes that aren't served fresh-sliced.

But in 2008, the price of those processing tomatoes jumped 30 percent. “[They were] the highest prices we ever saw in the industry,” says Stuart Woolf, who farms a wide variety of vegetable and nut crops in the valley.

Woolf grows the full complement of Central Valley produce: pistachios, almonds, wine grapes, garlic, onions, peppers, lettuce, and, of course, tomatoes. At certain times of the year, Woolf and his fellow farmers in the state's San Joaquin Valley produce a majority of the fruits and vegetables used in restaurants across America. But in 2008 and 2009, these farmers ran out of a vital ingredient in their production of those fruits and vegetables: water.

In the winters of 2007 and 2008, very little snow fell in California's Sierra Nevada Mountains. The lack of snow, which melts in spring and fills the state's many rivers and reservoirs, led to statewide water

shortages impacting cities and farmers. California's Bay Delta relies on the Sacramento and San Joaquin rivers, which start in the Sierras and flow to the sea. Since California receives much of its precipitation in the winter, every summer, when farmers need water for their crops, many of them use water pumped out of the delta for irrigation.

Endangered fish live in the delta, too. They are part of an entire ecosystem of plant and animal life reliant upon the mixing of fresh water from those rivers with salty water from the San Francisco Bay. In 2008, when federal officials realized very little water was coming out of the mountains for the second year in a row, they told farmers they might not get the quantity of irrigation water they were used to receiving because the fish might need most of what remained.

Farmers were forced to make a choice: save their nut trees and vine crops, high-value plantings they already sank a lot of money into that would surely die if they did not receive water, or plant tomatoes. Most of them chose the former.

“If you have a big block of land and some of it is in permanent crops—almonds, pistachios, wine grapes—what you are going to do is use that water to protect those permanent crops,” Woolf says. “Whereas if it's just open ground, maybe you don't plant a crop of tomatoes or a crop of lettuce.”

With fewer tomatoes planted, the supply quickly dwindled and prices skyrocketed. But tomatoes weren't the only crop affected. Tom Birmingham, the manager of Westlands Water District, which portions irrigation water out to farmers on the west side of the San Joaquin Valley, says farmers planted 16,000 fewer acres of lettuce in 2009 than they did in 2006. “There was a 17 percent increase in price for lettuce harvested in California,” Birmingham says.

The winter of 2009–2010 finally brought reprieve to the state and its farmers. The Sierra snowfall was well above average that year and the following, and there has been enough water for fish and farmers the past two growing seasons.

But Woolf knows the next drought will

come. In fact, as of March 5, the Sierra snowpack's average depth was only 16.8 inches, according to the National Weather Service. Last year at this time, it was 41 inches. If this year and future years stay dry, it's likely that farmers in California will once more be forced to choose between keeping their tree crops alive or growing the salad mix and salsa ingredients used in much of the nation's foodservice industry.

Unfortunately, it's not just in California that water shortages are a potential threat. Drought in Texas has significantly impacted food supplies from that state, and water-shortage conflicts between farmers and cities have also occurred in North Carolina and other Southeast states, where many poultry producers and hog and peanut farms make their home.

While today's supply chains are nimble and suppliers can often as easily buy from farmers in China as they can in California, water shortages can have a significant impact on food prices, availability, and quality—particularly with fresh foods, or those costly or difficult to transport. And despite some recent precipitation in Texas, the National Weather Service's outlook for the next three months shows drought persisting across the southern band of the U.S., from Georgia to Arizona, and also in California and parts of the Midwest.

## HOW WATER SHORTAGES HAPPEN

Agricultural water shortages are most often caused by drought, but they can also be caused by demographic shifts, political disruption, or even pollution of water resources. The latter happens more frequently in countries without water pollution laws. No matter the cause, water shortages created by any of these factors can affect the price, quality, and reliability of food.

While drought has always been a fact of life, particularly in agriculture, scientists predict climate change will increase the frequency and intensity of droughts in the future. As the average temperature of the planet increases, climate models predict shifts in the amount of rainfall, with less precipitation in many agricultural areas.

In addition, average day and nighttime temperatures will be warmer in many

regions, causing plants to use more water to survive. All this means that even as rainfall and the amount of water available decrease, agricultural needs for water will increase—a deadly combination for the nation's crops and the businesses that rely on them.

Scientists expect climate change will even lead to drought conditions in places typically unused to water shortages. In 2010, the Natural Resources Defense Council, a nonprofit whose work focuses on environmental issues, reported that more than one-third of all U.S. counties will face increased risk of water shortages as a result of global warming. Four hundred of those counties, stretching from Florida to the Great Plains, will be at “extremely high risk” for such shortages.

“Climate change will take a serious toll on water supplies throughout the country in the coming decades, with more than one out of three U.S. counties facing greater risks of water shortages,” says Dan Lashof, director of the environmental group's Climate Center, who commissioned the research on climate change–related drought. “Water shortages can strangle economic development and agricultural production in affected communities.”

When drought comes to regions unaccustomed to dealing with water shortages, it often causes conflict. Take, for example, South Carolina and North Carolina, two states in a part of the country typically considered water rich. State leaders have quarreled in recent years over North Carolina's use of the Catawba River, which flows from North Carolina into South Carolina. Drought in the region escalated the dispute, as growing cities in North Carolina sought more water from the Catawba, and South Carolina feared it would not receive its fair share.

In the nation's Midwestern breadbasket, where corn and soy prices set the tone for commodity and wholesale prices around the country, unexpected drought could ripple across the country. Midwestern grain crops provide feed for the majority of beef, pork, and chicken producers around the country, and commodity prices directly influence the cost of most other food prices, and even impact land prices.

A drought in this region could send

food prices sky high, as livestock producers would have to pass additional costs on to customers, and ingredient prices for everything from bread to bacon would skyrocket.

Climate change isn't the only problem. As the U.S., and the world, becomes more urban, city dwellers are demanding water that used to go to agriculture. Southern California's Imperial Valley farmers, who grow hay and grain for animals, citrus, avocados, and other warm-weather crops, are increasingly competing with residents of San Diego for water. The source of their water is the Colorado River, which starts in the Rockies and flows through seven Western states before reaching Mexico. It's where these Southern California farmers get irrigation water, and today it is over-allocated, meaning that states that depend on water from the river are guaranteed more water than it carries.

When there is a big Rocky Mountain drought, as there was in 2002, there could be a fight over which states get water, a socio-political battle that would be guaranteed to disrupt supply for farmers.

## THE TEXAS DROUGHT

While scientists forecast climate changes and extreme droughts several years in the future, Midland, Texas, could be out of water in less than a year. The town's water source, O.H. Ivie reservoir, is drying up fast, and if projections for rainfall hold true, will be empty in early 2013.

“It's a race as to whether they can get to water before it's a real dire situation,” says Jose Cuevas, referring to a \$140 million pipeline project to access underground water.

Cuevas runs Jumburrito, a group of seven quick-serve burrito stores in the area.

The city entered Stage 2 water restrictions in July 2011, which means Jumburrito's parking lots and sidewalks haven't been washed since.

“As you know, in the restaurant industry we have all kinds of spills and trash, and it's hard to have your lot looking clean and presentable when you're not allowed to wash it,” Cuevas says.

A dirty lot and withered landscaping

are not the biggest problems facing Cuevas, though. Oil and agriculture rule the area's economy, but tourism also adds a boost to the service industry's coffers. Hunters come from across the state and nation to shoot waterfowl on the many reservoirs in the region, or deer in its preserves. When there is no water, there are no ducks or deer.

“[There's] no boating activity, no swimming activity, they are just completely dead,” he says. “So we've seen a lot of recreational people who come by, the hunters, they are not there this year. And we don't expect it to get any better. That's a big deal, because people enjoy coming out to deer hunt. Coming into town, most of them stay in hotel rooms, so they eat out. And that's one less sale we have.”

The town's answer is to drill for untapped water reservoirs underground, but that's expensive, and the municipal water district will have to pass those costs on to its customers. Cuevas says he'll likely have to raise prices to account for his added costs.

“You always have to look at [raising prices], because the ever-increasing cost of doing business, the energy costs, or because of water, you always have to be cognizant of the fact that price increases are natural,” he says. “Fortunately here in Midland, Texas, we live in an economy that is booming, we only have 4 percent unemployment, so raising prices is not as much an issue.”

In other parts of Texas, where unemployment remains high, price increases could affect customers more.

Yuen Yung, CEO of How Do You Roll?, a 10-unit custom sushi shop, says his Austin-based chain has seen utilities go up as a result of the Texas drought, although there have not yet been water restrictions for commercial businesses. He expects food prices for the fresh produce his restaurants use will also increase as water shortages take their toll.

“We are anticipating that [the drought] will probably push our food prices up some,” Yung says. “The crops and the availability of those crops are going to be lessened. So because of that, the price of those crops will go up some.”

Yung speaks from experience. When California experienced its big drought in

2007 and 2008, Yung noticed jumps in some of his ingredient costs.

“We saw certain things just go way up,” he says, “like avocados and things like that, just took a pretty big hit.”

One way to combat price increases is to have a diversified supply chain, he says. Another: “Diversification of offerings.” For example, if cucumber prices go up, *How Do You Roll?* can swap them out for sweet peppers or carrots.

The eastern part of Texas, which is traditionally the wettest, is probably the least impacted by the state’s drought so far, local restaurateurs say. But even there, franchise owner Ernie Stith has noticed shifts in business caused by the drought.

Stith, who runs 15 Pizza Huts in east Texas, says business is fine, but he has had to absorb a big increase in ingredient costs because the drought is hurting the surround-

ing dairy and beef industries in the state.

“Our ingredient costs have gone through the roof; with the drought the price of meat and price of cheese have really gone up. We have seen an increase of meat and cheese to where it’s affecting our food costs 1–2 percent,” he says.

Stith also experienced decreased sales in one of his establishments, which is near Cedar Creek Lake, in Gun Barrel City. Much of the traffic to that restaurant comes from boaters and recreationists, and since the lake level went down, he got much less summer business last year.

“This summer, people couldn’t get their boats in the water,” he says.

If the drought continues, he adds, it might affect the local timber industry, which is a key economic driver in the area, and that could hurt business.

Stith, who has operated Pizza Hut fran-

chises since 1967, is used to hard times, though, and in his long-term view, there have been worse periods than this drought. He says the biggest hurdle his businesses have ever faced was the oil embargo of 1973, when gas and energy prices skyrocketed after Arab oil-producing nations withheld supplies to the U.S. and other Western countries.

It’s not just Texan restaurateurs feeling the crunch of the state’s water shortage. Restaurateurs across the country are watching the drought’s effects play out in their own operations, says Hudson Riehle, director of research for the National Restaurant Association.

“The drought in the Texas region has put upward price pressures on, for example, beef, and there’s been some premature liquidation of herds just because the grazing opportunities weren’t available,” he says. “But when you basically think that it takes a few years to grow a cow, that means that for that commodity group, obviously it will likely remain a challenging environment.”

As a result, the Texas drought will likely decrease supply for a number of years in the future, pushing up the price of beef and possibly affecting quality, too.

Hans Hess, the CEO of multistate franchise Elevation Burger, is also keeping an eye on Texas.

“If you think of the effects that water shortages will have on cattle, the short-term effect of that is it affects supply, and therefore price goes up,” Hess says. “When a situation like a drought comes, like in Texas, that has the potential to really put pressure on everyone because of its impact on the commodity market.”

When prices for commodity items like corn, soy, and grains run up, it pushes up wholesale prices for restaurateurs, from large chains like Burger King to Hess’s boutique franchise.

Commodity prices have already been affecting restaurants’ bottom lines, Riehle says, and they haven’t been able to pass all of that cost along to the consumer. He estimates 2011 had the highest wholesale food inflation in 30 years. Yet average menu prices have only increased 2.2 percent, which is even below the general inflation rate of 3.3 percent, and almost half of the

## ONLINE TOOL HELPS GROWERS MAP WHERE WATER IS

**SCIENTISTS AT THE USDA** are close to completing an online tool that will help farmers assess drought and irrigation impacts on crop development.

Agricultural Research Service (ARS) scientists Bill Kustas (left) and Martha Anderson (right) have developed an evapotranspiration (ET) and drought modeling system that uses satellite technology to identify drought-ridden areas across the globe.

The model, known as ALEXI (Atmosphere-Land Exchange Inverse), uses thermal infrared imagery from satellites to track soil and plant temperatures that can be used to create maps of plants growing in cultivated areas, forests, and natural habitats around the world.

For example, in wetland areas, plants and soils are covered with water that then evaporates into the air. That evaporation cools the land surface and indicates high ET rates. As a result, when

satellites identify areas with high ET rates, they’re identified as wetter than those with lower ET rates.

That data is then compiled to create ET maps, which detect rivers, lakes, wetlands, riparian buffers, irrigated cropland, and areas under water stress.

The National Oceanic and Atmospheric Administration, which is funding the research, plans to use the system to generate



ET estimates over the continental U.S., a project that will be particularly helpful to growers in areas such as the Texas Panhandle, the Florida Everglades, and the southwestern U.S.

Although getting routine ET estimates for individual fields is laborious, the researchers hope to move toward routine mapping at a “field scale” soon.

ALEXI has been estimating ET rates since 2000, but the researchers continue to refine the system and plan to make the maps available online soon at [www.drought.gov](http://www.drought.gov).

Anderson and Kustas’ project supports the USDA priority of responding to climate change, but it also will likely shift the way growers plan and cultivate their crops—a step that could lead to more stable commodities prices in the future.

4.4 percent increase consumers have seen at the grocery store.

### WHEN RAIN FAILS TO FALL

Western states like Texas and California are no strangers to drought. But the science of climate change says future droughts will spread far outside of areas accustomed to dealing with water shortages. In much of 2007, 2008, and 2009, the Southeast experienced water shortages, and states like Georgia are still short on the resource and fighting over access to rivers they share with their neighboring states.

Mike Aquaro is the Southeast district manager for Bon Appétit Management Company, which provides café and catering services to institutions like colleges and restaurants, including Duke University in Durham, North Carolina. He has relationships with several farmers who supply fresh vegetables and beef to the company's college and corporate foodservice operations in the Southeast. When the rain failed to come in Georgia and the Carolinas, he noticed.

"Probably the worst conditions that we experienced were happening between 2007 as it started in the fall-winter months, and then certainly through 2008 and continuing on and probably reaching the most severe point during that summer of 2008."

Bon Appétit's goal is to source at least 20 percent of its food locally, and the drought made that commitment difficult.

"We were seeing averages during the time of the drought dropping down to a low of 12–14 percent," he says.

And food quality suffered, too. Aquaro's chefs saw greens with burnt edges, a result of too much heat and not enough water.

It was with the smaller, more local vegetable producers that the company saw the most change when water was short, Aquaro says, probably because many of them did not have the infrastructure to irrigate.

"Producers that provided us with things like tomatoes and squash and cucumbers were really impacted, and for us that meant that supply levels were impacted," he says.

But Aquaro, and Bon Appétit, got lucky with beef. His main beef supplier, Harris Acres, had, with Bon Appétit's support,

recently switched to fish emulsion as an organic fertilizer on his pasture, rather than synthetic nitrogen fertilizer. It was part of an effort to use more organic products on the farm. It turns out there was a beneficial side effect: The alfalfa hay treated with fish emulsion grew deeper roots than hay treated with conventional fertilizer. Those deep roots were better at reaching water farther below the surface, whereas most farmers' hay had short roots and dried out. So, even while other beef producers saw their hayfields turn brown, Harris Acres continued to have enough hay to feed its cows.

"So we were lucky, I'll tell you," Aquaro says. "That was one of the areas that was a major concern as we were not only entering the catastrophic drought conditions here, but also in the midst of them, how that was going to impact our producer of grass-fed beef."

Not all restaurateurs were as fortunate as Bon Appétit's Aquaro.

George Frangos, the owner and operator of Farm Burger, a two-unit quick-serve burger joint in the greater Atlanta area, says drought hurt the local suppliers he buys from, and that cost him. Farm Burger falls into the growing category of quick-serve restaurants trying to sell healthy, fresh, and sometimes local and organic food at affordable prices. But when drought comes, that prized local produce becomes scarcer.

"From okra to heirloom tomatoes, if the farmers aren't producing as much, their prices go up," Frangos says.

At Salsarita's, a fresh Mexican chain with locations in the Southeast, franchisees take pride in the fact that they make their salsas fresh every day. Myrtle Beach, South Carolina, franchisee Chris Tobin says getting consistent products to make that salsa, however, is challenging during water shortages.

"Fresh produce is a great deal of importance to me and our brand," Tobin says. "During the drought it has been a challenge to get great-quality produce on a consistent basis. Our corporate office has spent a great deal of time working with vendors on providing us a quality, consistent product."

Farm Burger's Frangos says those higher produce costs hurt his margins.

"We don't really transfer that [higher price] on to the customer, because I don't

think the customer gets it yet, so we kind of take it on the chin."

In essence, customers are not yet ready to connect local water shortages with more expensive local produce—even if they value that a restaurant buys fresh and local.

Tobin, of Salsarita's, agrees that water scarcity impacts his bottom line.

"Between the drought and higher fuel cost to deliver products, profit margins are getting slimmer," he says.

While restaurants trying to source local produce may see higher prices in drought, it is also possible that small-scale farmers' growing methods—particularly organic ones—might help them weather drought better, says Natural Resources Defense Council agriculture policy expert Claire Althouse. Bon Appétit's experience with Harris Acres' long-rooted hay is a prime example. In fact, farmers growing with more natural methods may be better equipped to outlast drought than traditional agricultural operations.

"Organic farming helps the soil conserve a lot of water that's there, better," Althouse says.

That's also been the experience of Farm Burger's sister restaurant, Farm 255, a full-service establishment in Athens, Georgia. As the name implies, its own group of farms supplies the restaurant. While much of the Southeast was in a drought, says managing partner Olivia Sargeant, its farms, which also supply some SKUs for Farm Burger, did just fine. That's because the farm waters its plants using a technique called drip irrigation, where plastic hoses laid on the ground drip out water right at the plant's roots. This reduces water loss from evaporation, uses less energy than overhead sprinklers, and delivers water right to the plant roots, where they need it the most, Sargeant says.

The result: "As restaurants or farms we've never been affected at all by shortage," while other farms in the region were, she says.

### THE GLOBAL FACTOR

As the world's climate warms and its population grows, global competition for resources once taken for granted like water and soil

will play a role in how the U.S. restaurant industry operates. And some of the world's biggest food and beverage companies providing ingredients for foodservice are paying attention.

From a sourcing perspective, even smaller restaurants are globally connected. How Do You Roll?, the Texas sushi outfit, gets its fish from farms in Scotland, Indonesia, and the Philippines. Its rice comes from Japan. McDonald's gets some of its Angus beef from New Zealand.

Companies like the Coca-Cola Company, Nestle, and Unilever, the consumer goods company that produces salad dressings, Lipton tea, and cleaning products, have signed on to the CEO Water Mandate, a voluntary United Nations initiative where companies address the challenge of water scarcity worldwide by working with governments, nonprofits, and local citizens to use water resources more responsibly. The companies will benefit from joining the effort because planning and becoming more sustainable will keep them ahead of their competitors, says Jason Morrison, a researcher at the Pacific Institute, a California-based think tank that works on water issues around the globe.

"There's a big recognition from food companies that they need to be more aware of what they are sourcing and the water impacts of the crops they source, the commodities," he says. "You'll see, for example, subsidiaries of PepsiCo, like Nabisco, working with rice farmers [in Asia] to better manage water. It's about ensuring the long-term reliability of supply."

Multinational food companies like PepsiCo, which source from all over and whose products are in many restaurants, face three kinds of risk related to water, Morrison says. The first is related to availability, or supply of the water they use to make their products and run their operations. The second is related to regulation, since poor regulation leads to poor water quality for the products they are making. The third risk is a newer one, and it's about reputation. In the era of educated consumers, citizens won't support companies that are perceived as wasting water, or which lay claim to water needed by communities.

In parts of India, the Coca-Cola Company

and PepsiCo have both lost plant-operating licenses because of water shortages. Even in the U.S., Nestle Waters, which is opening a new bottled water plant in Colorado (and has tried to open one at the base of Mount Shasta in California) was fought by locals who perceived the plant as stealing one of their most precious resources: their fresh water.

## PLANNING FOR THE FUTURE

Water is tied to everything. It affects energy costs, wholesale food prices, product availability, and utilities. Although it's going to get scarcer, and drought is more likely, restaurant owners need not sit back and wring their hands, says Chris Moyer, a sustainability expert with the National Restaurant Association.

Moyer works within the industry to promote sustainable practices, and he's seen a lot that's hopeful in terms of water and energy conservation.

"The quick-service-restaurant industry has really stepped up to the plate," Moyer says. "McDonald's was an EPA Energy Star user a few years ago."

Campbell Soup Company, which owns brands like Pace salsa, Prego, and many soup varieties used in foodservice, has tried to take the lead in sustainability issues, one of which is water conservation.

"We have a full water inventory of our manufacturing plants worldwide," says Dave Stangis, the company's vice president of corporate social responsibility. "We have set aggressive public goals to reduce the amount of water we use to make 1 ton of food by 50 percent by 2020."

This effort has saved the company money, too. "Our investments in resource conservation since 2009 have saved more than \$27 million," Stangis says. Since 2009, when the company instituted water efficiency policies, it has used 1 billion fewer gallons of water yearly.

The NRA's Moyer agrees that much

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of the effort is "bottom-line driven. ... You already have a great audience when you show them that installing a \$75 spray valve [on their dishwasher] will save them money," he says.

Bon Appétit has a company-wide policy, part of its Low Carbon Diet program, that reduces water and energy use in its facilities. The company requires each on-site team, which usually consists of a chef and a general manager, to do an audit of their energy and water usage, and implement measures to conserve, says Helene York, the company's director of strategic sourcing and research.

"The kind of things that we have asked them to do is adopt a mechanism on their sinks in their coffee bars that is sometimes called the Starbucks Solution," York says. As the name implies, the strategy is named after the coffee giant, which instituted a similar water-saving mechanism in its coffee bars where, previously, water ran constantly.

York believes firmly in enlisting employees in company-wide efforts to save water.

"There is no question that when getting environmental responsibility to work, it has to be about training employees," she says. "So if you just change a device and don't train people how to use it, it doesn't work nearly as efficiently as if you train them. But if you train them, they can be part of the solution. They can own it, they can feel proud."

Restaurants can do their part to educate consumers, too, says Farm 255's Sargeant. When areas are in a drought, a small sign in the bathroom reminding customers that water is scarce and not to leave the sink running can make a difference.

Yet there remain some factors that range far from owner control, from climate change-related drought to oil prices to a growing global population, whose demand for food leads to high commodity prices and food costs, says Bon Appétit's York.

"Last year was the highest year on record for food inflation," York says. "The question really is, what is that due to? I have no doubt that water issues had something to do with that." 

Stephanie Ogburn is an environmental reporter and alum of Yale's School of Environmental Studies.