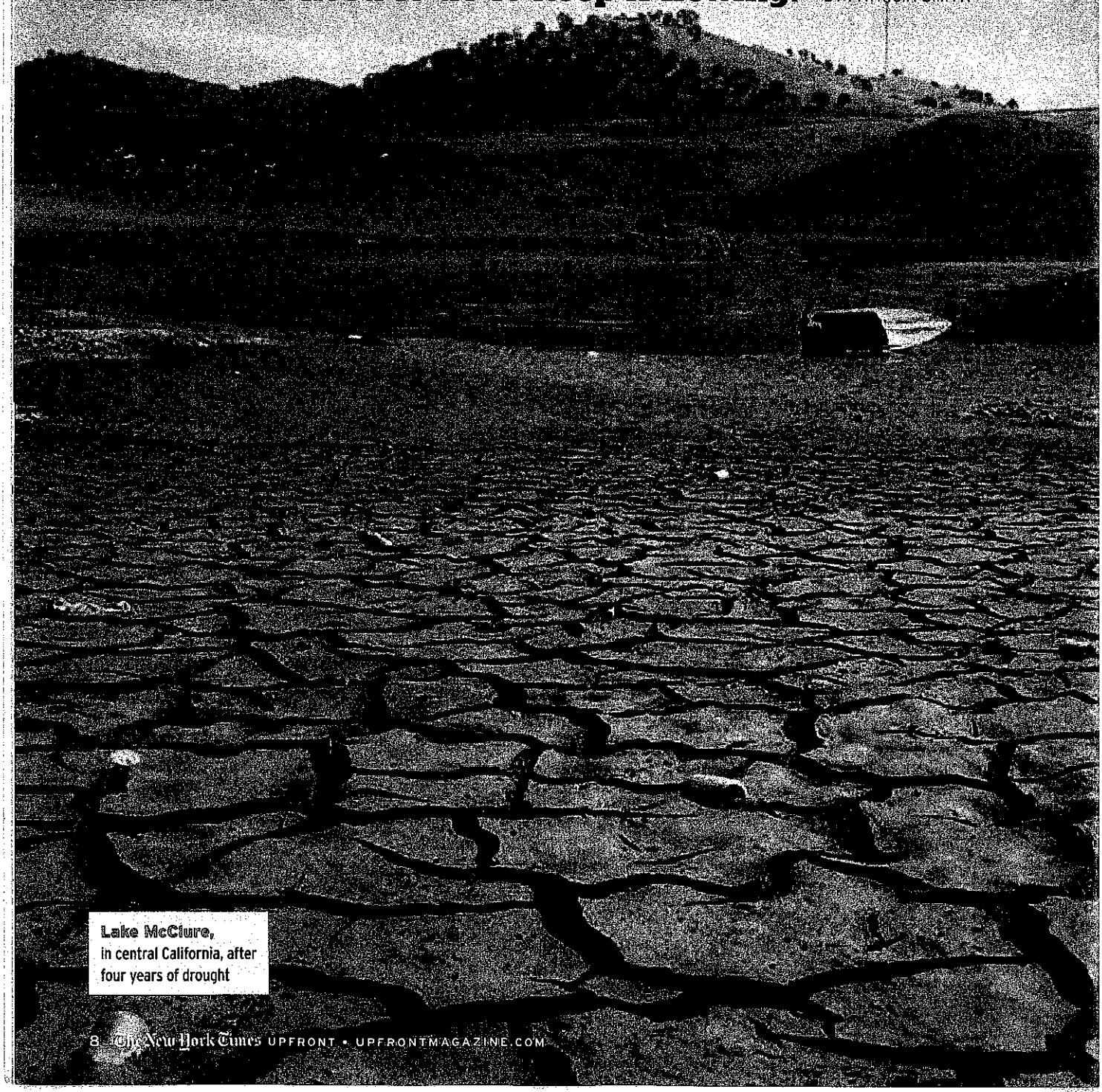
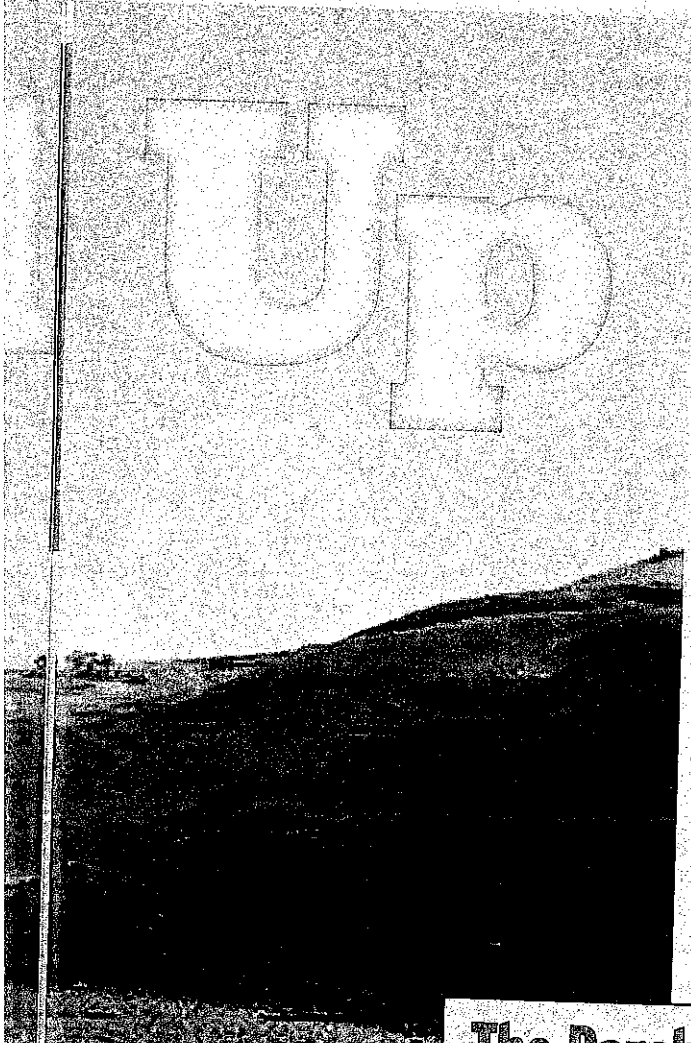
ENVIRONMENT

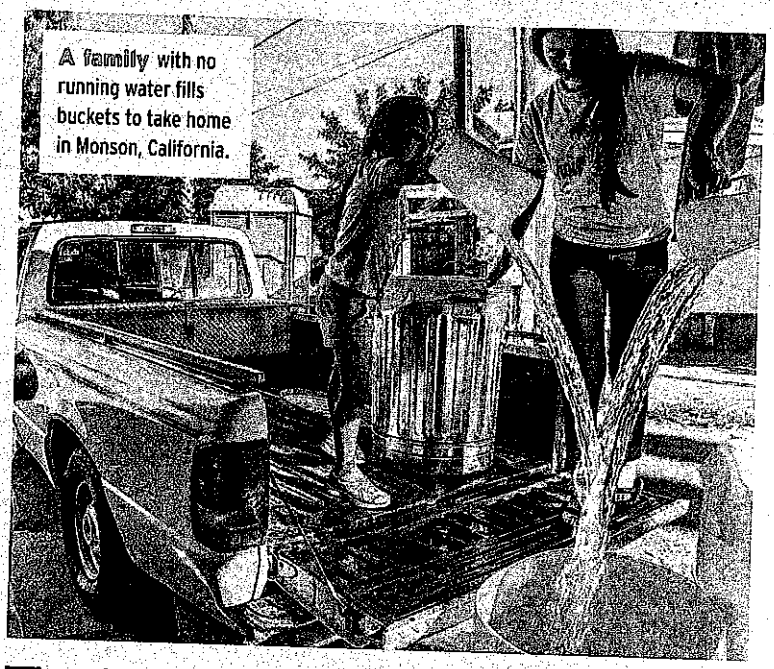
A Hard Price

California's record-breaking drought shows that Americans can no longer take water for granted. What do we need to do to keep it flowing? BY PATRICIA SMITH



Lake McClure, in central California, after four years of drought





A family with no running water fills buckets to take home in Monson, California.

Like most Americans, you probably don't give much thought to all the water you use. You drink it, you wash with it, you go swimming in it. And it's always there when you need it.

But in parts of California, the water has vanished. Residents can't take a shower, flush a toilet, rinse the dishes, or even sip a glass of water without reaching for a bottle or a bucket.

"You don't think of water as a privilege until you don't have it anymore," says Yolanda Serrato, whose home in East Porterville, about 150 miles north of Los Angeles, has been without tap water since her well dried up more than a year ago.

California is in its fourth year of extreme, record-breaking drought, and it's wreaking havoc on the state. Lakes and rivers have disappeared, thousands of acres of crops have withered, and suburban yards have gone brown—all because there isn't enough water to feed them.

The drought is affecting nine Western states, but California has been hardest hit *(see map)*. That's because weather conditions in the Pacific Ocean for the past few years have prevented major storms—both rain and snow—from reaching California. The result is that the most populous state in the nation is now facing a crisis.

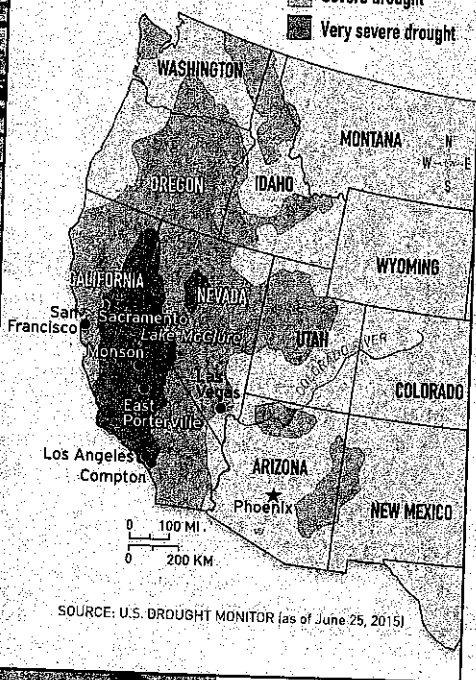
In April, Governor Jerry Brown imposed, for the first time ever, mandatory cutbacks in water use. Overall, residents and businesses will have to reduce their water usage by 25 percent.

"This is the new normal," Brown said, "and we'll have to learn to cope with it."

A drought is a period of unusually dry weather that causes water shortages. Periodic dry spells

The Parched West

California has been especially hard-hit by the current drought



SOURCE: U.S. DROUGHT MONITOR (as of June 25, 2015)

Watch a video explaining the California drought at upfrontmagazine.com

APOLINAR B. FONSECA/MOMENT OPEN/GETTY IMAGES (LAKE MCCLURE); JIM MCMAHON (MAP); RENEE C. BYER/SACRAMENTO BEE/ZUMAPRESS.COM (WATER BUCKETS)

are nothing new for California or other parts of the nation. Three things have made this one much worse.

First, climate change has caused higher temperatures that have made the effects of the drought more severe. Normally, much of California's water comes from snow in the mountains, which melts gradually in the summer to feed streams and reservoirs. But higher temperatures mean most of the precipitation—and there hasn't been much—has fallen as rain that evaporates or runs off into the ocean.

Second, the demand for water has never been greater: California's population has more than doubled in the past 50 years to almost 39 million.

And third, the state's agriculture industry is using increasing amounts of water. California is one of the nation's breadbaskets: Its 78,000 farms provide 25 percent of the food Americans eat, including about half of our fruits and vegetables.

Acres Unplanted

Feeding 318 million Americans requires massive amounts of water *(see chart, right)*. Since the state's rivers, lakes, and reservoirs are too low to supply the water that crops need, farmers are drilling wells—so many that scientists are worried about the supply of groundwater running out.

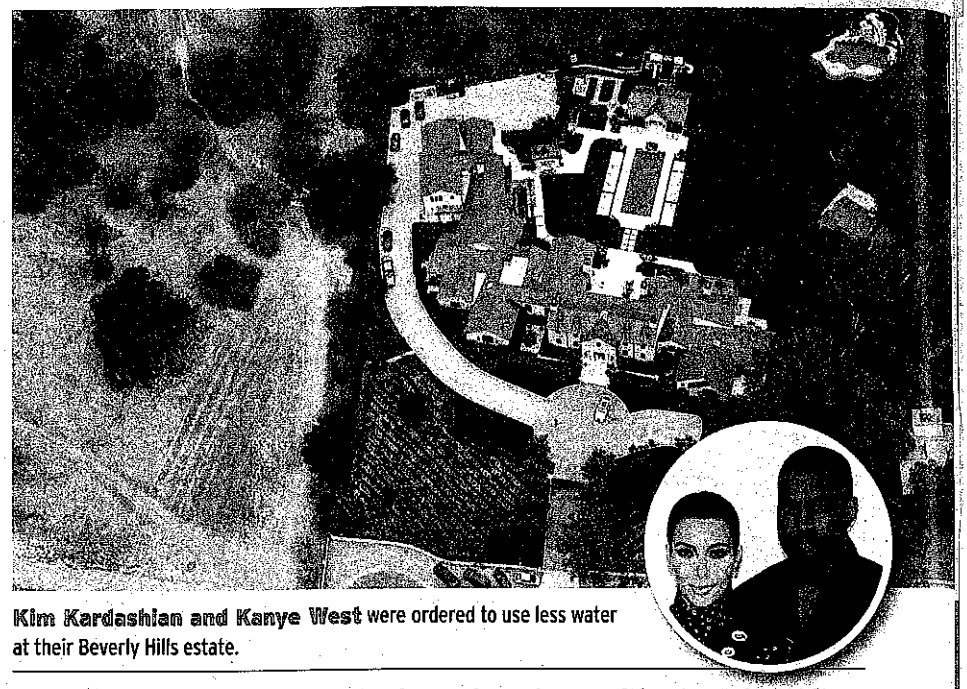
Farmers have also cut back on production, leaving hundreds of thousands of acres unplanted. If the drought goes on, we'll all feel its effects. For example, if the supply of grapes and strawberries declines and fewer make it to your supermarket, the price is likely to rise.

The underlying problem is that much of the region is essentially a desert: California has redirected massive amounts of water—largely from the Colorado River*—to supply the needs of its people, farms, factories, and lawns.

What does that mean for California's future? The state has always been a land of hopes and dreams, starting with prospectors seeking fortunes during the 1840s Gold Rush, later to those drawn by the glamour of Hollywood, and most recently by millennials in search of high-tech jobs in Silicon Valley. But California is now confronting fundamental questions about limits to its growth.

"Mother Nature didn't intend for 40 million people to live here," says Kevin Starr, a historian at the University of Southern California. "This is literally a culture that since the 1880s has progressively invented, invented, and reinvented itself. At what point does this invention begin to hit limits?"

Across the state, people are feeling the effects of rising water prices and

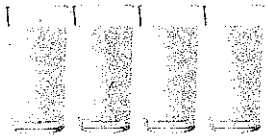


Kim Kardashian and Kanye West were ordered to use less water at their Beverly Hills estate.

How You Contribute to California's Drought

The average American consumes more than 300 gallons of California water each week by eating food grown there

A bunch of grapes requires **24 gallons**



Four glasses of milk requires **143 gallons**

1.75 ounces of beef requires **86 gallons**

Three mandarin oranges requires **42.5 gallons**

16 almonds requires **15.3 gallons**

SOURCE: *THE NEW YORK TIMES*

JOHN CHAPPLE/SPLASH NEWS/CORBIS (HOUSE); MEDIAPUNCH/REX SHUTTERSTOCK/AP IMAGES (KIM AND KANYE); AGE FOTOSTOCK (GRAPES); SHUTTERSTOCK (MILK, BEEF, ORANGES); ISTOCKPHOTO.COM/GETTY IMAGES (ALMONDS)

*The Colorado River runs through Colorado, Utah, Arizona, Nevada, and California.

the mandatory cutbacks—although not equally, some complain.

In Compton, a working-class city in Southern California, Lillian Barrera has stopped watering her lawn and started serving her family dinner on paper plates so she doesn't need water to clean up.

"I try to save water," says Barrera, who works as a housekeeper in Beverly Hills and is frustrated by what she sees there. "In Beverly Hills, they have a big garden and run laundry all the time."

Statewide, half of residential water use is outdoors—mostly for watering lawns. Celebrities like Jennifer Lopez and Kim Kardashian have taken a beating on Twitter for continuing to water their estates despite restrictions. Authorities this summer ordered Kardashian to cut water use on her property by 50 percent.

'Mother Nature didn't intend for 40 million people to live here.'

Water restrictions will likely become more common in the years ahead, according to scientists, who say that climate change is making most of the West drier and hotter—and more drought-prone. (East of the Mississippi, the trend has been for more rainfall.)

"Climate change is really weighting the dice" in favor of future major droughts, says Toby Ault, a climate researcher at Cornell University in Ithaca, New York.

How Israel Beat a Drought

So what steps could California take to get the water flowing again? For starters, it could look at what other water-challenged places have done. Israel, whose desert climate is similar to California's, has faced severe drought and found ways to combat it. During a seven-year-long drought that began in 2005, Israel began reusing wastewater on a massive scale and built four major desalination plants to turn the salt water of the Mediterranean into drinking water.

"We can live a normal life in a country that is half desert," says Shaul Ben-Dov, who lives outside Jerusalem.

Key to Israel's success is that the water system is managed by the national government; it has raised prices to encourage conservation and invested in system-wide improvements. (Economists say water is too cheap in the U.S., so we have little incentive to conserve it.)

These efforts have mostly solved Israel's problem. But the tricky part is that water is a necessity, not a luxury, so you can't price it beyond the reach of the poor.

Could California follow Israel's lead? Several California cities are considering high-tech plants that would clean wastewater so it can be reused for everything from agriculture to washing, and even drinking *(see "From Toilet to Tap?")*.

With 840 miles of coastline, California's most obvious source of water is the Pacific Ocean. But first the salt has to be removed, an expensive process. In Santa Barbara, a desalination plant that hasn't been used for 20 years is being reactivated at a cost of about $40 million.

"Desalination is our absolute last resort," says Santa Barbara Mayor Helene Schneider. "Unfortunately, given the way the drought is going, we are now at that last resort."

There's a chance Mother Nature might solve the problem on her own. That's essentially what happened in Texas, where a series of torrential rains in May refilled parched lakes and reservoirs, ending a years-long drought.

California could get relief this winter—if a strong El Niño** weather pattern brings some big winter storms. But the longer-term regional trend is still for hotter, drier weather, scientists say. And that will require ongoing adaptation.

"We have to become more resilient, more efficient, and more innovative," says Governor Brown. "And that's exactly what we're going to do." ●

With reporting by Justin Gillis, Matt Richtel, Adam Nagourney, Jack Healy, Nelson D. Schwartz, Henry Fountain, Isabel Kershner, Jennifer Medina, and John Schwartz of The New York Times.

**El Niño is a warm ocean current that sometimes develops in the Pacific and can cause severe weather conditions, including major storms.

SHUTTERSTOCK

From Toilet to Tap?

What if the only water you could drink came from someone's toilet?

Yuck, you say? That might soon be the situation in parts of California, where some counties are experimenting with an idea known as "toilet to tap." In a nutshell, wastewater that's flushed down people's pipes gets cleaned and then reused as drinking water.

Officials at a treatment plant in Orange County say the water that enters the facility after being flushed down a toilet actually leaves the plant cleaner than anything that comes out of a bottle at the supermarket.

But try telling that to most people. Even with the advanced technology used to purify it, 13 percent of Americans say they wouldn't try drinking "recycled water," according to a recent study.

Despite the resistance, Wichita Falls, Texas, has used such a system since 2014. In California, San Diego and Santa Clara are considering it.

Then there's the International Space Station, which reuses liquid from the toilets and even the moisture from breath and sweat.

"I drank it for six months, and it was actually quite tasty," says Colonel Douglas H. Wheelock, who served as commander of the station in 2010. But that didn't stop his colleagues from laughing about it.

"We had a running joke on the station," he says. "Yesterday's coffee is tomorrow's coffee."