

Prologue

*T*HE CRACK CREPT just like ivy. It sprouted from below ground, then inched up the brick of David and Vivian Atteberry's home in an Orlando, Florida, suburb. With a thick, black marker, David Atteberry measured its journey, along with those of the cracks that had appeared in the ceilings and at the edges of almost every window in the house.

When the crack in the brick grew six inches in one day, David Atteberry called his insurance company. The adjuster came to see, and called a geologist. The geologist drilled a hole, and left in a hurry.

"Mr. Atteberry, are you sitting down?" the adjuster asked when she called.

He sat.

She told him that the ground was swallowing his house.

"It's a massive sinkhole," she said. "You should pack your family and get out of there."¹

Back home in Illinois, the Atteberrys had never heard of sinkholes. In Florida, they are common enough: some too small to notice, some big enough to sink a chunk of highway or a Porsche dealership, as one did in Winter Park in 1981.

Sinkholes are collapses in the limestone rock that underlies Florida.

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The peninsula sits atop what geologists call “karst,” a pocked terrain formed over millions of years as water dissolved the limestone to create sinkholes, as well as Florida’s spectacular blue springs and its mysterious underground rivers and caves.

These shifting “sinks,” as they are known, are as natural to Florida as the waves that shape the state’s 1,400-mile coastline. But human activity can open them up, too: highway construction, excavation of fill dirt, well drilling, and, particularly, the excessive pumping of groundwater.²

In the last half century, Florida has seen extraordinary population growth—from 2.8 million people in 1950 to 17 million today. The current decade will bring about “the largest absolute population increase of any decade in Florida’s history,” says Stanley K. Smith, director of the University of Florida’s Bureau of Economic and Business Research. Florida has a net influx of 1,060 people every single day. The math looks like this: 1,890 move in; 945 move out; births outnumber deaths by 115; total average daily population growth equals 1,060.³

Among obvious consequences like traffic gridlock and crowded schools, this relentless growth causes thousands of other, more subtle problems, for one, an increase in the severity and frequency of sinkholes. To supply water to more than 90 percent of its booming population, Florida relies on groundwater pulled up from permeable aquifers underground. Almost everywhere else in the United States, water withdrawals have flattened in recent years despite population growth, thanks to conservation and greater efficiencies in water use. But the Sunshine State sucks up more and more water all the time, primarily to keep its fast-spreading lawns and golf courses green.

Today, Floridians are pumping groundwater out of their aquifers faster than the state’s copious rainfall can refill them. Meanwhile each new master-planned community, shopping mall, and highway drains water in a bit of a different direction and lowers groundwater levels a little bit more. These are precisely the sorts of geologic disturbances that cause sinks, essentially funnels in the porous limestone.

In Central Florida, the sinkhole problem has become prevalent enough that the government saw fit to put out a brochure for homeowners. Called “Sinkholes,” its cover shows a single-family home half-topped into a huge crater of sand and water. The booklet pinpoints the most sinkhole-prone part of Florida, a stretch of the central west coast that draws blue-collar retirees who have cashed out of the Midwest to

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afford a modest home in a planned community. The most sinkhole-vulnerable county, Pasco, is also one of the one hundred fastest-growing counties in the United States.⁴

It would be handy to come across the brochure while house hunting. In Florida, that is about as likely as finding a real estate Web site with a link to the National Hurricane Center. But soon, home buyers will learn about sinkholes: when they are denied insurance. Florida's major carriers have quit writing policies in those parts of the state where sinkhole claims are highest.

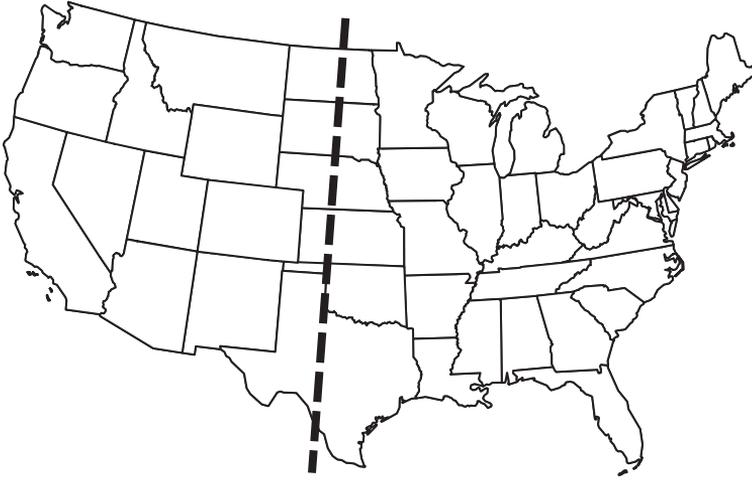
Crisis? Families like the Atteberrys would say so. But sinkholes are just one small symptom of a much greater problem facing Florida and other parts of the eastern United States for the first time since humans began living here some 12,000 years ago.

A shortage of life's most important ingredient. Water.

Until recently, people in the eastern United States enjoyed an abundance of freshwater. In fact, they thought there was far too much of it. In 1876, Major John Wesley Powell, the adventuresome one-armed explorer who then headed the U.S. Geological Survey, declared that a longitudinal line along the 100th meridian, down the middle of North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas, divided a moist East from an arid West. To the west of the line, he reported to Congress, a lack of rainfall would require cooperative irrigation and an equitable system of water rights to ensure scarce water would be used for the greatest good. To the east of the line, more than 20 inches of rainfall a year meant that people could settle and grow anything they wanted without irrigation.

Powell, the first American to explore the wild Colorado River, likely would be shocked by its modern-day taming, and by the complex, hardly equitable distribution formula that greens 1.7 million acres of desert and sends water to 20 million residents in California, Arizona, and Nevada, even as it supplies water to Colorado, Utah, Wyoming, and New Mexico. The Colorado and the other major rivers of the West are so overallocated to farmers and to cities that some have dried up completely. The mighty Rio Grande River that historically sent a steady torrent of freshwater into the Gulf of Mexico now peters out before it reaches the sea. The San Joaquin River no longer flows into San Francisco Bay but rather disappears into a giant plumbing system where it is doled out for agricultural irrigation and drinking water for California's unstoppable growth.⁵

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In 1876, federal explorer Major John Wesley Powell declared that a longitudinal line along the 100th meridian divided a moist East from an arid West. Western settlers would have to irrigate and share water. People east of the line had so much water they would never have to worry about it. It turns out they should have. Vast wetland drainage, development, and overuse have led to water scarcity and water wars in many parts of the wet East.

(Map © Christopher Sheek.)

But Major Powell might be even more surprised by the water crisis lapping at the southeastern part of the country. After all, nature graces the South with an average rainfall of fifty inches a year, more than double the amount Powell deemed enough to grow—with no irrigation—any crop that could take the heat.

In the spring of 2004, the nation watched the West with worry as snowmelt in the Colorado, a veritable faucet for cities from Denver to Los Angeles, dropped off by half, resulting in the driest stint in a century of recorded history. By then the man-made backup for western water supply, the major's namesake Lake Powell, had lost 60 percent of its water in a stark reminder that American ingenuity has not quite tamed Mother Nature.⁶

As the western story played out aboveground—the *New York Times* ran dramatic color pictures of Lake Powell's ten-story-high, salt-bleached cliffs—a quieter tale percolated below the soil in the American South. That region, too, was enduring the driest spring in one hundred years. Rainfall deficits of ten inches, near-record-low stream flows, and dried-

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out soils wreaked havoc on farmers and water managers from Mississippi to Florida.⁷

Traditionally water-rich regions throughout the eastern United States have been threatened in recent years by some combination of overuse and drought. At the National Drought Mitigation Center, housed at the University of Nebraska at Lincoln, director Don Wilhite says researchers who have long worked on the water problems of the West are being called upon increasingly to help cities, farmers, and others in the East.

“We’re seeing that the number of basins or watersheds at the point of being overappropriated is increasing. This has long been a problem in the West, and now it’s more and more of a problem in the East,” Wilhite says. “And we’re seeing a tremendous reliance on groundwater in cities in the East as well as the West. Florida is just one of many areas where the groundwater is not going to be able to sustain the growth.”⁸

Without the deep reservoirs of the West, many fast-growing eastern cities already were vulnerable to temporary water shortages. Intense population growth and the spread of development have made water problems perpetual. In Raleigh, a combination of overpumping and drought has nearly emptied Falls Lake, the only water supply for North Carolina’s capital city. Residents tied up 911 lines trying to report their neighbors for washing cars. Some had to limit showers to four minutes.⁹

In northeastern Massachusetts, parts of the Ipswich River so famous for its namesake clams go completely dry each summer—as soon as the Boston suburbanites who rely on the river for water turn on their sprinklers and fill up their swimming pools.¹⁰ In New Jersey, the Potomac-Raritan-Magothy Aquifer, the state’s largest source of drinking water, dipped precipitously as population growth and development hiked groundwater pumping. Water levels dropped a hundred feet, threatening saltwater intrusion.¹¹

As water shortages flow east, so do a river of consequences—far more serious than quick showers. In Ipswich, low river flow regularly devastates fish and wildlife habitat, leading to fish kills and closing of the clam beds.¹² During a state of water emergency in New Jersey in 2002, the government halted use of water for construction or use by any new “building, dwelling or structure” in three southern New Jersey townships.¹³

The same year, New York City’s water supply reached the most dangerously low levels in more than thirty years, resulting in a drought emer-

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agency declaration for the city and four upstate counties. More than 9 million residents were ordered to restrict water.¹⁴

Today, water managers in a majority of the states believe they will see shortages within a decade, and that is without drought.¹⁵ But nowhere in the country are water shortages more puzzling and prophetic than in notoriously wet Florida—a regular guest on the Weather Channel thanks to its violent hurricanes, thunderstorms, and floods.

NEW STORIES OF SCARCITY

American historians and journalists alike have filled bookshelves with many a good read about water, from Wallace Stegner's biography of John Wesley Powell to Marc Reisner's *Cadillac Desert*. But almost all of those books are set west of the 100th meridian. That made sense over the past century as the West divvied up the Colorado River, built its grand dams and diversions, and lived out dramas from flood to drought.

Today, however, equally theatrical tales of water shortage are playing out in the East. This one is about Florida, but the state is a portrait in miniature of many national and international water problems. In telling water stories about one place, I aim to dig into the bigger questions that surface when people start thinking about water.

One, who owns water? It depends where you live. Western water law is governed by a doctrine called "prior appropriation," which means the one who first dipped his or her straw into the river holds rights to the water, regardless of who owns the land. In the East, so-called riparian rights mean whoever owns waterfront land has the right to "reasonably" use the water.

Where does water come from? In the West, it is mostly surface water, melting off snowcaps and barreling down (or trickling down, as the case may be) the great rivers of the region. In the East, residents rely, too much so, on groundwater, pumped from deep in ancient aquifers.

Like almost every other story about the Sunshine State, this one starts with dramatic population growth. Now the fourth-largest state in the nation, Florida within the decade will balloon another 21 percent, exceeding 21 million people by 2015 to pass New York in population and become the third largest after California and Texas.¹⁶

Whether Hispanic immigrants or retiring baby boomers, there is one fact the newcomers will not find in the Florida relocation guide. The

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state no longer has the water to support them all. Officials in four of Florida's five water-management districts report they do not have enough water to supply projected population growth past the year 2025. Groundwater overpumping has led to emergencies in every region. In South Florida, saltwater intrusion has contaminated freshwater supply in some coastal cities. In Central Florida, some neighborhoods have been plagued by sinkholes and dried-up wells. In the Keystone Heights area of North Florida, the problem is bone-dry lakes. Hundreds of families in the region who once lived the waterfront life now look out over docks that stretch uselessly onto white sand and grass.

WATER, WATER EVERYWHERE

Water does not really disappear, of course; the earth is cycling the same water today that the dinosaurs splashed in 100 million years ago. But Floridians have managed to drain, ditch, and divert so much water that there is not enough left in the ground for fast-growing population centers, especially during times of drought. The bizarre tale of how one of the wettest places in the nation managed to get rid of this much water makes up the first part of *Mirage*. Chapter 1 weaves Florida's history of draining swamps and filling wetlands. Chapter 2 reveals America's water patterns, and Florida's remarkably wasteful ones. Chapter 3 reports on the lessons learned as the American West diverted and doled out more water than exists in its rivers, and how eastern states seem headed down the same path. Will the nation's transfer of political power from the Northeast and Midwest to the Sunbelt states result in huge transfers of water, as well? For Great Lakes residents, this is a real and frightening threat.

Chapter 4 is about the often-ironic, sometimes tragic consequences of getting rid of too much water. By drying up their wetlands, for example, Floridians also are drying up their rain. In Louisiana, where coastal wetlands provided a barrier between New Orleans and the sea, Hurricane Katrina proved people need wetlands protection just as much as fish and shorebirds do.

Mirage's middle chapters turn to the politics of water. Chapter 5 explains the greening of Jeb Bush, who led Florida for an unprecedented two Republican terms, from 1999 through 2006. In one way or another, all eight of those years were focused on water: from the massive effort to

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restore the Everglades, to increasingly severe hurricanes, to the urgent task of finding new water supplies for developers. The chapter tells how, and why, a politician with unhidden disdain for environmental laws and preservation spending during his first, unsuccessful run for governor in 1994 left office a dozen years later with a green reputation. Of course, despite a powerful environmental ethic in Florida, economic development and growth almost always trump protection of natural resources such as water—no matter which political party is in power.

Both politics and water in the Sunshine State once were controlled by agricultural interests, but farmers are quickly losing ground (literal and metaphoric) to home builders, whose influence is the subject of chapter 6. Ever since Florida became a state in 1845, those risk takers who would turn swamps into cities have been able to influence policy in Tallahassee and Washington with their convincing promises of paradise. That is truer than ever today, as Florida's development industry with a \$42 billion impact has passed agriculture to become the second-biggest economic driver in the state, behind tourism.

At this writing, Florida's top three political leaders were all developers: Governor Bush a real estate developer, the senate president a home builder, the house Speaker a paving contractor. Not only are Florida's home builders among the largest campaign contributors, to both Republicans and Democrats, at both state and national levels, they are also key political advisers. While CEO of WCI, Florida's largest home-building company, for example, Al Hoffman was also finance chairman for the Republican National Committee during both of George W. Bush's presidential campaigns.

This is how, unbeknownst to the average U.S. taxpayer, Florida's water woes now command attention, as well as billions of federal dollars, at the national level. While citizens across the nation might agree with spending \$10 billion to save America's Everglades for environmental reasons, the elected officials who don khaki garb for photo ops in the swamp have an equally important motive: urban water supply. The Comprehensive Everglades Restoration Plan now underway in South Florida is the largest public works project in the history of the world. While sold to the public as an environmental project, it is equally a strategy to increase water supply to the cities of southeast Florida.

Mirage's latter chapters explore the conflicts and controversies inevitable when a resource becomes scarce. Foremost are the water wars,

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the subject of chapter 7. Florida, Alabama, and Georgia have fought for more than twelve years over the Chattahoochee and Flint rivers, which supply water to metro Atlanta on their way to Florida's Apalachicola Bay. And politically powerful South Florida has challenged the bucolic but politically weak northern half of the state for its historic Suwannee River as yet another water source to quench future growth. Many other water-rich areas of the eastern United States, including the Carolinas, also are fighting over water resources due to intense growth and unclear rules about who is entitled to them.¹⁷ The Great Lakes region, meanwhile, is gearing up for the day its leaders think is inevitable: when thirsty parts of the United States come looking for water.

Chapter 8 tackles the bottled-water industry. Why do bottlers in Florida and around the nation get to pump groundwater for free, then sell it at an eye-popping profit, just as citizens are being asked to wean themselves off groundwater and spend money on costly alternatives such as desalination plants?

Chapter 9 explains the weird economics of water. Why is water so cheap? More mysteriously, why do those of us who are well-off pay so much less for water than those who are poor? This is a truism globally and locally. In Palm Beach County, Florida, residents of the exclusive east coast island of Palm Beach use, on the average, more than four times the water but pay half as much for it than the farmworkers of Belle Glade on the west side of the same county.

Chapter 10 reveals how private companies in Florida and around the globe are posturing to profit from increasing water shortages. Speculators such as Texas corporate raider Boone Pickens are gearing up for the time when water, from Texas on east, will be bought and sold like pork bellies as it is in much of the West.

Chapter 11 confronts the concerns and the promise of new technology. In addition to its massive Everglades restoration project, Florida plans an orgy of high-tech water-supply initiatives, from desalination plants to aquifer wells that pump water during wet times and store it deep underground to pull up in periods of drought. If the state's leaders have their way, federal taxpayers will help them fund part of this effort, too. Florida's congressional delegation is pushing federal desalination legislation to help fast-growing areas pay for the expensive plants.

In the twentieth century, all Americans footed the bill for the huge water projects that subsidized development of the arid West. In the

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twenty-first, taxpayers are being asked to help fund costly new water supplies for the significant population shift now underway to the nation's Sunbelt. Before they fork out these billions, Americans may want to ask a few questions: Will eastern states take heed of mistakes made in the West, where many waterworks have devastating ecological consequences, and where most rivers are so overallocated that during times of drought there is not enough water for legal users—no less for fish and wildlife? And, faced with a new specter of water scarcity, will flagrantly wasteful states such as Florida learn from conservation-minded places like California that continued growth and development do not have to mean higher and higher rates of water consumption?

S T A T E O F M I N D

The remarkably wasteful ways we use water, the legal and natural workings of water, its vibrant social and political history and puzzling economics: all demand understanding as more and more of America faces water scarcity.

A century ago, Floridians thought their biggest problem was too much water where people wanted to settle. Now, our biggest problem is that we do not have enough water where people want to settle. How did this about-face occur in just one hundred years?

Digging for the answers starts in the muck of Florida's once-too-wet lands, in the moxie of its settlers. Those intrepid souls got rid of water at every turn, draining wetlands by the thousands of acres and filling them in.

Just as important as the physical remaking of water and land in Florida was the remaking of the state in the American imagination. When Florida was under water, its pitchmen divvied it up and sold it by the acre, hawking mosquito-infested swamps as tropical paradise. Today, even as water-related headaches such as sinkholes plague families like the Atteberrys, a new generation of boosters works to spin a myth of Florida as oasis.

Like a family suspending its reality during a Disney World vacation, being a Floridian means buying into the myth. Just ask David and Vivian Atteberry. The hole that opened in their middle-class subdivision sank more than their custom-built home. During a fight with their insurance company, the Atteberrys lost their house in foreclosure. The

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ordeal forced them back to Illinois, where, in their fifties, they now live with Mrs. Atteberry's elderly mother.

But in their minds, the Sunshine State is still a dreamy paradise. They say they will return, if they ever get the chance. "We left because we didn't have a place to live and we were desperate," Mr. Atteberry says. "But we didn't want to leave. We love Florida. If we could, we'd be there today."