INTREPID JOURNEYS

Denial, it’s been said, is not just a river in Egypt.

It runs, of course, through each of us. But Californians have displayed quite a dose of it as a record-breaking drought rolls through its fourth year.

It was just last week, propelled by [the lowest snowpack](http://news.nationalgeographic.com/2015/04/150402-california-snowpack-drought-water-science/) in the Sierra Nevada in recorded history, that Governor Jerry Brown announced mandatory water-use cutbacks averaging 25 percent for the state’s 400 municipal water utilities.

With only [one year of water supply left](http://www.latimes.com/opinion/op-ed/la-oe-famiglietti-drought-california-20150313-story.html) in the state’s surface reservoirs, and rampant [depletion of groundwater](https://www.nasa.gov/press/2014/december/nasa-analysis-11-trillion-gallons-to-replenish-california-drought-losses/), the world’s eighth largest economy and the nation’s premier producer of fruits and vegetables is in some trouble.

Scientists have determined that this drought, which began in 2012, may be the worst the state has experienced [in 1200 years](http://www.commondreams.org/news/2014/12/05/california-drought-worst-1200-years-study).

Yet cities still use potable water to irrigate grass along road medians. The Santa Fe Irrigation District in southern California, which, despite its name, supplies not farms but some 19,300 people, tallied residential water use in February 2015 of [345 gallons per person per day](http://www.nytimes.com/interactive/2015/04/01/us/water-use-in-california.html?&_r=1)—4.5 times the state average for that month and up 30 percent from two years earlier.

The state’s water use in February 2015 was only 2.8 percent lower than it was in February 2013, which, [according to](http://www.latimes.com/local/lanow/la-me-ln-california-water-rationing-fines-20150407-story.html) the Los Angeles Times, officials called an “alarming trend.”

Clearly, the [governor’s urging a year earlier](http://www.sfgate.com/news/article/California-drought-Gov-Jerry-Brown-urges-20-5152625.php) for voluntary water-use reductions of 20 percent had come to little effect.

Meanwhile, some 44 percent of California’s 9 million acres of crops are flood-irrigated. That means far more water is applied to the land than the crops require. While some of it seeps down to groundwater, recharging depleted aquifers, it can pollute those aquifers with farm chemicals. Some of the irrigation water simply evaporates into the dry air.

Up until now, the state has acted like the frog that remains in the slowly warming pot of water, unable to grasp that danger lies ahead and that it must leap to a safer place, before the boiling point is reached.

But with the new mandatory restrictions, the governor is taking the first big leap out of the warming pot.

And therein lies the silver lining in this otherwise dark, dry cloud: the opportunity to fundamentally transform how water is used, managed and valued in the Golden State. If it does so, California will not only become more resilient to future droughts, it will prepare itself for the water future now unfolding as the planet heats up.

To succeed, California needs new rules, incentives and strategies that unleash the state’s lauded innovation and ingenuity in order to get more value per drop and to achieve a better balance between human uses and nature’s needs for water. Success also requires a “we’re-in-this-together” brand of cooperation between cities, farms and conservationists that maximizes the productivity and benefits of water.

 Fortunately, there’s significant progress to build upon, though still a long way to go.

Agriculture accounts for about 80 percent of the state’s water consumption, so incentives to conserve farm water and share the savings with cities and the environment is a crucial strategy. Already about a third of farm acreage is under water-thrifty drip irrigation, which often boosts crop yields even as it reduces water use. Continuing this trend toward more value per drop can keep agriculture thriving even as water supplies tighten.

Many California cities have seen their water use per resident drop considerably in recent decades. Water use in Los Angeles today is about the same as it was in 1970, even though 1 million more people live there. This achievement is largely due to the 1993 federal law that established efficiency standards for toilets, faucets and showerheads. These standards saved trillions of gallons nationwide, and, because they literally built conservation into new homes and offices, they were particularly important in rapidly growing western cities.

Water use outdoors for lawns and landscapes, which accounts for half or more of water use in many California cities, is the new frontier in urban conservation. The governor’s new order includes the replacement of 50 million square feet of lawns (an area a bit larger than Golden Gate Park) throughout the state with drought tolerant landscaping – a good start. It also requires campuses, golf courses, cemeteries and other large-landscape enterprises to cut their water use.

The needed transformation will not occur, however, without greater economic incentives to conserve and trade water. For example, tiered water-pricing  – which charges more per unit of water as usage increases — can motivate users to conserve to avoid those high-end rates.

Markets, too, need to play a bigger role. What if cities paid farmers to upgrade to more efficient irrigation practices in exchange for the water saved? This, in effect, is the kind of deal San Diego struck with the Imperial Irrigation District, which has rights to one-fifth of the Colorado River.

Temporary leasing of water can also make a big difference. Farmers can fallow or stop irrigating a portion of their land for part of the year, and then lease the water they don’t need to a city or to a conservation group working to add flow to a depleted river.

Alfalfa, for example, requires enormous quantities of water during the hot summer, and yields often go down then, so eliminating a cutting or two in summer can free up the saved irrigation water for other uses without harming (and maybe improving) the farmer’s bottom line.

Farmland can sometimes double as critical habitat for a portion of the 4 million migratory birds that pass through California’s Central Valley each year. The valley has lost 95 percent of its original wetland area, so birds have lost places to rest, nest and feed.

In [one innovative project](http://www.nytimes.com/2014/04/15/science/paying-farmers-to-welcome-birds.html), the Nature Conservancy pays rice farmers in the Sacramento Valley to keep their fields flooded with irrigation water as migrating flocks arrive. Farmers bid to lease their water, and the lowest bidders win.

In addition to more effective use of pricing and markets, reporting and regulation of groundwater use is crucial. Groundwater is the go-to water supply during droughts, when surface supplies are scarce, but California has been depleting its aquifers in wet years as well as dry ones. Last year the state [passed a groundwater law](http://www.sacbee.com/news/politics-government/article2608207.html) that calls for the most-stressed basins to develop management plans by 2020 and achieve sustainability by 2040. While a positive step, the time-line for results needs to be shortened.

It took the historic Millennium Drought, or [Big Dry](http://ngm.nationalgeographic.com/2009/04/murray-darling/draper-text/2), to lure Australia out of complacency about its water predicament and to undertake some [bold water reforms](http://voices.nationalgeographic.com/2011/11/28/australia%E2%80%99s-grand-water-experiment-%E2%80%93-take-two/). Hopefully this drought will be just the wake-up call California needs to do the same.

Some will say it’s too difficult to up-end long-held water habits, practices and entitlements.

But those difficulties are certain to pale next to those wrought by empty reservoirs and dry wells.

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