

# Climate change accelerates water hunt in U.S. West

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By Peter Henderson

SAN FRANCISCO (Reuters) - It's hard to visualize a water crisis while driving the lush boulevards of Los Angeles, golfing Arizona's green fairways or watching dancing Las Vegas fountains leap more than 20 stories high.

So look Down Under. A decade into its worst drought in a hundred years Australia is a lesson of what the American West could become.

Bush fires are killing people and obliterating towns. Rice exports collapsed last year and the wheat crop was halved two years running. Water rationing is part of daily life.

"Think of that as California's future," said Heather Cooley of California water think tank the Pacific Institute.

Water raised leafy green Los Angeles from the desert and filled arid valleys with the nation's largest fruit and vegetable crop. Each time more water was needed, another megaproject was built, from dams of the major rivers to a canal stretching much of the length of the state.

But those methods are near their end. There is very little water left untapped and global warming, the gradual increase of temperature as carbon dioxide and other gases retain more of the sun's heat, has created new uncertainties.

Global warming pushes extremes. It prolongs drought while sometimes bringing deluges the parched earth cannot absorb. California Department of Water Resources Director Lester Snow says two things keep him up at night: drought and flood.

"It isn't that drought is the new norm," said Snow. "Climate change is bringing us higher highs and lower lows in terms of water supplies."

Take Los Angeles, which had its driest year in 2006-2007, with 3 inches (7.6 cms) of rain. Only two years earlier, more than 37 inches (94 cms) fell, barely missing the record.

California Governor Arnold Schwarzenegger declared a drought emergency last month, and Los Angeles plans to ration water for the first time in 15 years. Courts are limiting the amount of

water taken from into rivers to save decimated fish populations, which is cutting back even more to farms.

California farmers lost more than \$300 million in 2008 and economic losses may accelerate to 10 times that this year as 95,000 people lose their jobs. Farmers will get zero water from the main federal supplier.

Nick Tatarakis sank his life savings into the fertile San Joaquin Valley but now thinks his business will die of thirst.

"Every year it seems like this water thing is getting rougher and rougher," he said. "I took everything I had saved over the last three or four years, put it into farming almonds, developed this orchard. Now it is coming into its fifth year and probably won't make it through this year."

## SWINGING TEMPERATURES, PRICES

In the global economy, a little trouble goes a long way when supplies are tight, said University of Arkansas Ecological Engineering professor Marty Matlock.

The essence of climate change is greater swings in precipitation -- and thus food production. At times of peak demand, prices can skyrocket, he said, as happened to food prices last year.

"There's no slack any more. The rope is tight, and if you give it a tug, it yanks on something," he said.

While farmers suffer, cities continue to grow. The sunny, warm American West remains a magnet.

"Add water and you have the instant good life," said James Powell, author of "Dead Pool," a book about global warming and water in the U.S. West.

"For the last few years, the driest states, Arizona, Utah, and Nevada, have been the fastest growing. And you know that can't be sustained," he said.

California, the world's eighth-largest economy, already uses a staggering amount of water -- roughly enough to cover the nearby state of Washington with a foot (30 cms) of it.

Some 80 percent is used by farms, growing organic lettuce on the temperate coast; rice and citrus inland. Almost anything will grow in the ideal climate -- if there is water.

California water planners in a draft report see three different scenarios for the state by 2050. In the most unfettered, suburbs sprawl ever-farther, replacing productive farms with water-soaking lawns and the population doubles -- as does urban water use. In the best case scenario for water use, the population increases about 20 percent, but denser housing and conservation help keep urban water use roughly steady.

All of the scenarios show agricultural output dropping -- it is just a question of how much.

Businesses, too, have much to fear. Semiconductor manufacturers and beverage companies are high on a list of at-risk sectors in a report on corporate water by Pacific Institute and investor group Ceres.

## SLOW CHANGE

Change is happening too slowly, nearly all water planners say, but they disagree about what to do and which options are financially viable, especially the expensive dam projects favored by agricultural interests.

Climate change's challenge to traditional water supplies starts in the mountains. The snow-capped Sierras in eastern California and the Rockies farther east feed rivers that provide a steady supply of water through much of the year.

The Sierras will have 25 percent to 40 percent less snow by 2050 as rising global concentrations of greenhouse gases raise the temperature, California's water department forecasts.

The U.S. Climate Change Science Program sees the entire West on average getting less precipitation, but there is plenty of debate about that. There is a consensus, however, that most of today's snow will turn in coming decades to rain, often in the form of blinding thunderstorms early in the year, when it is needed least.

California wants to raise or build new dams to catch the increased flow as part of a broad set of solutions.

"There is no one silver bullet," the water department's Snow said.

But the Natural Resources Defense Council and a Los Angeles business coalition see dams as a costly solution that mostly favors farmers.

"The dams are an expensive detour that I don't think will ever be built," said Lee Harrington, executive director of the Southern California Leadership Council, a group of urban public utilities and other businesses.

A study by his group put the price of new dams at up to \$1,400 per acre foot. Current supplies cost about \$700 for one acre foot -- a year's supply for two houses. Urban water conservation costs \$210, local stormwater \$350 and desalination of ocean water or contaminated groundwater about \$750 to \$1,200 an acre foot.

The NRDC estimates that California could get 7 million acre feet per year from conservation, groundwater cleanup and stormwater harvesting.

Even energy-intensive desalination is cheaper than dams, the group argues. "People always used to think that desal was the lunatic fringe of water supply. (Now) desal is the mainstream, and dams are exiting the mainstream," said policy analyst Barry Nelson.

But so far water is the cheapest utility in most homes and businesses, and it's treated that way.

"As long as you are undervaluing a resource, you are going to be perpetually short," said Robert Wilkinson, director of the Water Policy Program at the University of California, Santa Barbara.

Many see water's pricing future following that of electricity. Despite the energy crisis of the early 2000s, California leads the nation in controlling electricity use. One key strategy was letting utilities charge more when consumers use less, making power producers advocates for conservation.

But the simple conclusion is that the West must secure a water supply, even at a high price, says business advocate Harrington.

"While these options are expensive, the options of not having the water makes them all viable at the end of the day," he said.

(Editing by Alan Elsner)