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Global Warming, Drought and the Grim Reaper

Will the opulent fountains in Las Vegas be a thing of the past? Every drop of water in Las Vegas is now precious as a relentless 11-year drought in the Southwest begins to imperil the way 25 million people live.

Welcome to a drier world.

And it's not just the southern half of the U.S. that's feeling the bite. Bolivia is enduring its worst drought in 30 years as over 50,000 wildfires have scorched the forests. Although parts of Australia have received rainfall after an 11-year epic drought that continent is far from out of the woods as Earth's temperatures continue to rise.

History teaches us that prolonged droughts decimated the Pueblo peoples of the American southwest and the Angkor of Southeast Asia. Repeated drought cycles annihilated millions of Mayans in Middle America.

Over the last decade, the Southwest has suffered the sharpest temperature increase on the continent, declining late season snowpack, loss of vegetation, billions of bark beetles and rampant wildfires; all the while growing faster than any other region in the United States.

Global warming is predicted to heavily reduce snowfall along the Southern Rocky Mountains by as much as 45 percent over the next four decades.

Winter snowfall accumulates as a snowpack and the high elevation Engelmann spruce, subalpine fir and limber pine forests provide an essential cover so that the snow melts slowly in the springtime and feeds the headwaters of the mighty Colorado River which drains one tenth of the land base in the lower 48 states.

Global warming has not only significantly reduced the Southern Rockies snowpack but it's melting it three weeks earlier in the springtime. And the result over the past decade has been a startling increase in the number and size of hot-burning wildfires.

In the early 1930s, Lake Mead was created to hold back the Colorado River to create power from the Hoover Dam. Lake Mead also supplies water to Arizona, California, Nevada and Northern Mexico.

In the late 1920s, scientists estimated the Colorado River volume to be 16.4 million-acre feet a year. Today, scientists studying tree ring growth patterns, which are an accurate indicator of moisture, concluded that the 20th century was one of the wettest in the west in the last millennium. It turns out that the water allocation of the Colorado River was overestimated by at least two million-acre feet a year.

In 2008 scientists from San Diego's Scripps Institute released bold projections on the future of Lake Mead. They based their predictions on one million-acre feet a year deficit of the Colorado River, massive amounts of evaporation from the lake and the viscous effects of a warming world from climate change.

They predicted that by 2017 there was a 50 percent chance that the Hoover Dam would not be generating power. Currently, the lake is at 1,083 feet, it's dropping at 10 feet a year and the turbines stop spinning when the level reaches 1,050 feet. In 2000, Lake Mead's level was 1,215 feet above sea level.

The Scripps' scientists also predicted a 50 percent chance that Lake Mead would run dry by 2021. And although this may seem rather farfetched some very recent research from University of California Los Angeles clearly shows that the next couple years could be even drier across the southern half of the U.S.

It seems a perfect storm driven by climate over the short, medium and long term is brewing in both the Atlantic and Pacific Oceans; the three climate patterns are all set to collide and produce a major drought.

Ancient tree rings from pinyon pines have been used as sensitive "listening posts" to determine climate variability and in particular drought.

This is what the tree rings are telling us: When Pacific Ocean sea-surface temperatures plummet as much as 18F La Nina's occur, lasting for up to 18 months and the Southwest experiences a drought. There's a 30-year Pacific Decadal Oscillation pattern that also affects climate, when its negative it extends the La Nina and prolongs droughts. There's a third climate pattern that lasts 60 years called the Atlantic Multidecadal Oscillation, which changes the surface temperature of the North Atlantic. If it's positive it has little effect on California but when it's linked up with a negative Pacific Decadal Oscillation, snowpacks in the west decline on average 10

percent and the Colorado River decreases discharge by as much as 18 percent. Incidentally, a positive Atlantic Multidecadal Oscillation also strongly correlates to major droughts in the Midwest, Southwest and the 1930s Dust Bowl.

Las Vegas draws 90 percent of its water from Lake Mead. Strict water conservation measures have reduced the cities demand by 20 percent but that's not going to be enough. Southern California is also, by law, reducing its water use by 20 percent or 1.7 million-acre feet a year (more than two years the supply for Los Angeles).

Clearly, we all are going to become far more efficient at how we consume water. Across America we use 7 billion gallons of water a day during the summer on urban landscape vegetation. That will change and quickly.

Global warming is a citizen's issue. Therefore we are all required to lend a helping hand.

It's not just the southern half of the U.S. -- the world is running out of fresh water. Unless we all become very efficient at water conservation, within a few short decades, humans are set to create a freshwater demand that will far outstrip a warming Earth's supply.

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