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California Focus: State faces bone-dry forecast

We need to plan for having less water for the foreseeable future

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A warmer Earth is highly prone to prolonged periods of droughts. Currently, according to UNESCO there are about 1.1 billion people lacking drinking water and approximately 2.6 billion people without basic sanitation.

From about AD 800 to 1300 the Earth underwent a slight warming period, dubbed by climate scientists as the Medieval Warm Period. Most places experienced milder winters and longer summers but temperature differences never amounted to more than 1.5 degrees Fahrenheit or so.

Everywhere was not necessarily warmer. For example, the eastern Pacific region, specifically California, was cooler and much drier. La Nina – or the cooling of the eastern Pacific – forced the winter jet stream north of California and denied snowfall from accumulating in the Sierra Nevada (the state's main source of fresh water).

Owens Lake, a dry lake in eastern California, was once 115 square miles in area. During the megadrought from AD 910-1090, thirsty cottonwood trees and Jeffrey pines migrated to the receding Owens Lake shoreline, only to be completely submerged during a very wet period from AD 1100-1210. For the next 140 years (AD 1210-1350) California, much of western North America, Central and South America and across the Pacific to China was enveloped by severe aridity.

Then for the next five and a half centuries, up until the beginning of the 20th century, Earth experienced a more stable climate.

Today, California is experiencing a long statewide drought. Although it is nothing like the megadroughts of 1,000 years ago, it is a concern as it now coincides with the state's budget deficit.

In the past, California's fire season extended from March to November; but now the drought has brought the state a year-round fire season. And Gov. Schwarzenegger is requesting a new tax – $1 a month from every homeowner – to pay for escalating firefighting costs.

One fiscally prudent measure of combating fires in California would be to mobilize the

large prison population to help thin out the state's overstocked forests, remove hundreds of thousands of dead oaks killed by sudden oak disease, and the millions of drought-starved and beetle-killed trees acting as kindling.

Since June 21, lightning-induced fires in California have charred over 1,400 square miles, or more than 900,000 acres, and incinerated over 100 homes. This year's fire season has easily eclipsed the 1936 record of 756,696 acres burned in a year, and we still have months of hot, dry weather ahead.

Clearly, drought fuels wildfires but, in addition, this year's fire season in California has caused extreme levels of air pollution.

And as a result, doctors are seeing more patients struggling to breathe.

California also has the most intensive agriculture production on Earth, and, due to recent water restrictions, many farmers are reassessing planting water-demanding tomatoes, cotton, corn, rice, alfalfa and sugar beets. Instead they are looking to safflower, a water-smart plant that sends its roots down as deep as 10 feet to find water and nutrients out of reach of other annual plants. Safflower produces seeds used to make oil used in cooking and in salad dressings. Over 100,000 acres of safflower has been planted this year, double the acreage of 2007.

California is certainly not alone with its water shortage crisis. Computer models from Britain's Hadley Center for Climate Prediction and Research predict a 3 percent to 18 percent increase in the amount of the Earth's surface that will be exposed to extreme drought by 2100; 40 percent of the world will suffer from severe drought, up from the current 18 percent; and 50 percent will suffer from moderate drought. Western states including California will suffer severe drought. By 2050, UNESCO estimates that 2.8 billion people will live in water-scarce areas like California.

Humans are exceptional problem solvers, and we are highly adaptive. This ability to adapt to circumstances like drought will become perhaps our greatest achievement. We need to follow nature's blueprint and mimic drought-survival tactics of both plants and animals in order to survive the forecast bone-dry times ahead.