

# Climate change could trigger 110-degree heat waves in Calif.

Anne C. Mulkern, *Environment & Energy Publishing*, 5-7-12

Deadly heat waves in California could happen more frequently within the next decade and could occur regularly by the end of the century because of climate change, a researcher has told the state's Energy Commission.

Those heat waves will feature three days or more when temperatures hit at least 100 degrees Fahrenheit, and temperatures as high as 110 degrees are probable if the world stays on its current path of high greenhouse gas emissions, said David Pierce, a climate researcher at Scripps Institute of Oceanography in San Diego.

"Historically, we've had two of those bad heat waves since 1950," Pierce said. "Between about 2020 and 2040, we start getting several every decade, and by about 2070, we start getting them regularly."

Pierce drew the conclusions after running climate models with different emissions levels and then accounting for California's topography. He looked at how temperatures are likely to change in the areas where most people live. The bulk of the Golden State's population is located close to the coastline, although it is believed that as the state's population expands over the century, the number of people inland will climb.

Pierce's work will be submitted to the Intergovernmental Panel on Climate Change (IPCC) as it prepares its next report. Pierce also presented the results to the California Energy Commission (CEC) last week as part of a workshop that agency held to look at how warming might affect power issues. Representatives from Golden State Gov. Jerry Brown's (D) office, the state's Department of Natural Resources and other agencies also attended. The information received will become part of a paper CEC produces every two years on power outlook.

"Climate change is a reality," said Kelly Kells, spokeswoman for CEC. "We start needing to look at the effects of it and kind of adapt and form our policies to work around those issues."

Past heat waves in the Golden State have killed. One in July of 2006 -- which was part of a North American hot streak that stuck in many states and Canada -- is blamed for 164 fatalities in California.

## Coastal areas unprepared for extreme heat

What could make future heat waves particularly troublesome is that they might affect both inland and coastal California. Many homes along the state's coast do not have air conditioning because temperatures there remain temperate. That means it will be much harder for people living along the coast to find ways to keep cool as the thermostat climbs, researchers said.

"If you have 110 degrees along the California coast, that's a catastrophe," Alexander Gershunov, a climate researcher at Scripps who has studied the past heat waves. "On the coast, we're not acclimated to extreme heat."

People in Las Vegas or Tucson, Ariz., have learned how to live with 110-degree temperatures, he said, by staying indoors where there is air conditioning. But in coastal California, "we are much less able to deal with it," he said.

"It doesn't need to be as extreme or as warm as it is inland in order to create a bigger impact," Gershunov said.

In the 2006 heat wave in California, it was far warmer inland, and that is where most of the deaths occurred. But there were a high number of emergency room and hospital visits on the coast, Gershunov said.

The recent trend in heat waves has included higher nighttime as well as daytime temperatures, Gershunov said. When it does not cool off at night, more air conditioning typically is needed to keep buildings comfortable during the day. As well, he said, people are much likelier to become ill more quickly.

### **Ocean fog may provide some relief**

If people use more air conditioning to keep cool, that compounds the problem unless there is a change in how electricity is produced.

"If that energy is generated by burning fossil fuels, then it will contribute to accelerating climate change," Gershunov said.

According to Pierce's findings, the severe heat waves from 2020 to 2040 are likely to include temperatures 100 degrees Fahrenheit or higher. If the world stays on its high emissions path, he said, by 2070, heat waves with temperatures greater than 105 degrees and as high as 110 degrees become more probable. The bouts of hot weather are likely to happen quite often, as frequently as every few years, Pierce said.

"Toward the end of the century, that really becomes quite routine," Pierce said.

What is not known is how much average temperatures will increase in the coming years. That will affect the ability of people and ecosystems to adapt to higher temperatures, Gershunov said.

"Is it warming so fast that natural acclimatization cannot take place?" Gershunov said. "Then ecosystems will be severally impacted. Plants will be impacted not just by heat but by less water availability to them."

The one factor that might aid coastal California is the marine layer, Pierce said, a blanket of fog that often rolls in from the ocean in the mornings and leads to cooler temperatures. Global climate models do not account well for that feature, he said.

The difference in temperature between the coast and inland contributes to the formation of a marine layer, he said.

"If we got more frequent marine layer incidents, it would moderate the heat waves," Pierce said. "But we don't know if that is going to happen."

Those marine layers don't happen as much in peak summer months of August and September, however, he said.

"But we do get heat waves in September," Pierce said.