

## **Why the San Joaquin Valley's air quality is so bad right now**

By Marc Benjamin

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Don't hold your breath that the San Joaquin Valley's stagnant air will leave the region anytime soon.

Air quality has deteriorated over the past week as pollutants are being trapped closer to ground level by the warmer air of an inversion layer that is also lower than normal.

Warmer temperatures are the persistent problem, but they might not be due to a larger meteorological factor such as the recently forecast weak La Niña that could bring less rain to the Valley and Southern California this winter.

The Valley's air quality is a toxic soup roiling throughout the year, but pollutants vary between winter and summer. Winter pollution is caused by extremely fine dust and chemical particles. Summer pollution stems from the presence of more ozone-generating chemicals.

At this time of year, conditions change depending upon the time of day. On fall and winter days the daytime pollution is caused by motor vehicles, while fireplaces and wood stoves cause more nighttime pollution.

"We've had a strong near-surface inversion in the morning and the air aloft is warmer than air on the surface," said David Spector, a meteorologist with the National Weather Service in Hanford. "When the air aloft is warmer than air on the surface, it traps polluted air closer to the surface."

But relief from the bad air may soon be at hand: A storm system from the north could bring rain to the Valley next Wednesday, lowering temperatures and clearing the air as it dips into Central California. The system could deliver light rain in the Valley as far south as Bakersfield.

As temperatures drop, perhaps about 15 degrees from Tuesday to Wednesday, "we will see a pretty significant cooling aloft that should help mix this (air) out," Spector said.

This year appears to be a weak La Niña weather pattern, which means Pacific Ocean waters are cooler than last year, and there will be fewer storms coming from the central Pacific, storms known as the Pineapple Express.

Generally, it means less rain, but it doesn't mean that there won't be a surge in systems from the northern Pacific. It also doesn't mean Pineapple Express storms won't make their way into California, Spector said, just that fewer are expected.

And that could result in worsened air quality for longer periods of time.

Earlier this week, the San Joaquin Valley Air Pollution Control District curtailed wood burning for the first time this fall in Fresno, Madera, Kings and Tulare counties.

The curtailment prohibits the use of unregistered devices because they contribute to poor air quality. Financial incentives for new burning devices are available from the Valley Air District.

To find the Valley's daily wood-burning status for each county, go to the Valley Air District website.

This is historically the worst time of year for air quality, but as high as the pollutant concentrations are now, they are lower than historical levels, said Seyed Sadredin, executive director of the Valley Air District.

Moisture remaining from the most recent rains mixed with higher than normal humidity levels is a key ingredient in forming ammonium nitrate, which accounts for higher levels of particulate matter, Sadredin said.

Until new wet systems come through, the pollution problems will continue, and the relief brought by storms can be temporary, said Chris Cappa, professor of civil and environmental engineering at University of California at Davis, who took part in the DISCOVER-AQ aerial study that examined ground-level air quality in the Valley.

“Rain is typically a very good thing because it helps clean out the atmosphere temporarily to reset things, but it’s often just a short-term reprieve,” Cappa said.

Adding to the problem is the warmer temperatures.

“It’s a reaction between NOX (nitrogen oxides) from vehicles, especially diesel vehicles, and oxidants in the atmosphere during the days and at night,” he said. “It gets exacerbated when it gets warmer.”