

WINE COUNTRY FIRES



Photos by Gabrielle Lurie / The Chronicle

Sgt. Richard Mair pauses next to a flipped car on Dogwood Drive in Coffey Park, a Santa Rosa neighborhood where blocks were leveled by the firestorm.

Blaze surged into flaming storms

Firestorm from page A1

the California Department of Forestry and Fire Protection, and an expert on fire behavior. "It was no different than a hurricane, really, but instead of rain we had a fire event. I've been in this business 30 years and it's the worst I've seen."

Upton said fire whirls, also known as fire tornadoes, probably happened in all the North Bay fires, but the most destructive evidence was found in Santa Rosa neighborhoods flattened by the Tubbs Fire, which has killed at least 22 people and burned 36,432 acres. Recovery teams are still searching for remains in the rubble.

The homes destroyed in the city's Fountaingrove and Coffey Park neighborhoods burned in rapid succession. As flames driven by powerful winds slammed into the neighborhoods, the heat rose up, pulling the wind with it and creating a kind of vortex of air that circled around at hurricane-force speeds.

"Think about the massive release of heat in a fire like that, and then the wind gets obstructed by homes and you get the eddying," Upton said. "The hot air mixes with cooler air, and that's when it will start to turn, creating a fire whirl."

The whirling winds blew fire sideways into homes in Santa Rosa, peeled off roofs, and even lifted and turned vehicles. Survivors recounted running out of their homes into the equivalent of a blast furnace, with embers flying everywhere amid a terrible gale.

"They can be incredibly powerful if you add more heat or wind or fuel, like in this fire," he said.

Upton compared the situation to Lake County's Rocky Fire in August 2015, when superheated flames, fueled by dry brush, sent huge clouds of smoke as far as 35,000 feet into the atmosphere, where they actually formed ice caps, pushing out wind in every direction.

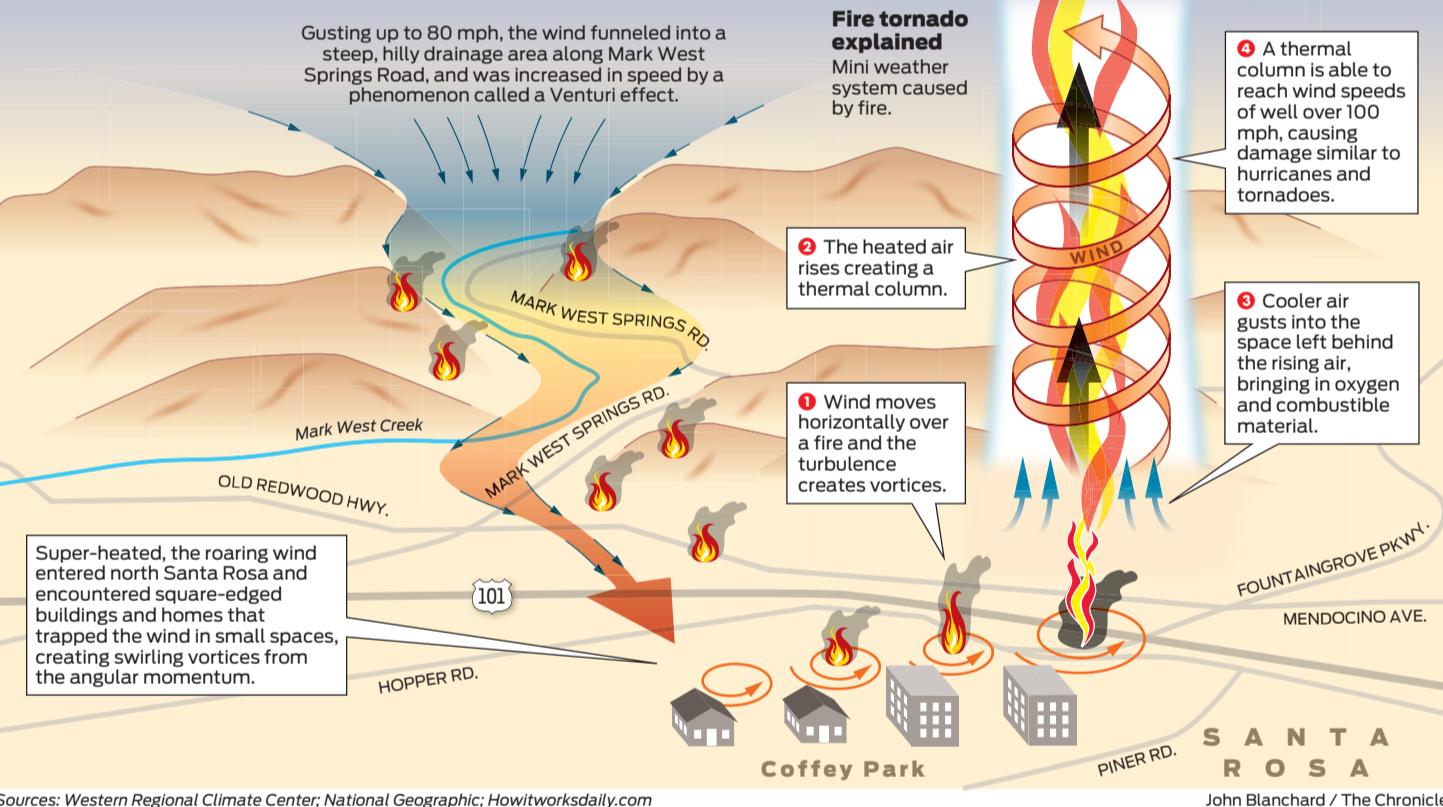
In the Tubbs Fire, superheated air also lifted off the ground and created wind, but that's where the similarities end.

Upton said fire tornadoes normally occur in open spaces, kind of like the way dust devils form on farmland and fields. He said the 2003 Cedar Fire, which burned 280,000 acres, destroyed 2,232 homes and killed 15 people in San Diego County, is the closest comparison.

Just like the Wine Country blazes, the Cedar Fire spread rapidly as a result of Santa Ana winds and fire tornadoes. The 1991 Oakland Hills Fire, which

Tubbs Fire unleashed tornadoes

In the late night hours of Oct. 8, the first hours of the Tubbs Fire, a high pressure system over the Central Valley was moving air west in a northeasterly flow to a low pressure system over the coast of California. The change in pressure was so marked that hurricane-force gusts were the result.



Sources: Western Regional Climate Center; National Geographic; Howitworksdaily.com

John Blanchard / The Chronicle



Fire tornadoes flipped cars like these on Dogwood Drive in Coffey Park; they uprooted trees and tore the roofs off houses as they raged into Santa Rosa neighborhoods.

killed 25 people and destroyed 3,500 houses, also created its own weather — a firestorm.

Fire whirls can be extremely violent. They have been known to lift all-terrain vehicles off the ground. In 1926, a fire whirl in San Luis Obispo lifted an entire home into the air and carried it across a field before dropping it. Two people were killed.

The phenomenon can't happen without strong winds and dry fuel, which have been in abundance throughout Northern California.

The night the fires started on

Oct. 8, the winds were a steady 40 mph, pushing flames east to west through a valley in the hills along Petrified Forest and Mark West Springs roads, feeding it like oxygen nourishes a torch, and driving it into the flatland neighborhoods.

"Just like water flows from higher to lower elevation, winds flow down a pressure gradient as they go from high pressure to low pressure," said Max Moritz, a wildfire specialist with the UC Cooperative Extension. "When they get concentrated, like through a

mountain pass, they will speed up, like a river going through a narrow channel."

Moritz said powerful winds also drove the Hanley Fire, which burned almost the exact same area in 1964.

That fire, which ignited when a hunter discarded a cigarette, burned 83,000 acres over a week and leveled 84 homes, 24 summer cabins and countless farm buildings; included was the historic Tubbs Mansion. Nobody was killed in the fire, which was finally halted on the north perimeter of Santa Rosa,

but those who fought it were traumatized.

"This is the craziest fire I've ever seen," Grant King, the chief of the Guerneville Fire Department, told The Chronicle at the time. "The wind just hangs back, then fire comes in a rush with the wind, and you're dead."

The wind-driven Tubbs Fire shot out of the same canyon into Fountaingrove and Coffey Park.

"It was a very different kind of fire that happened Sunday night," said Ken Pimlott, the director of Cal Fire. "The fire was almost horizontal. When it hit those homes it was like a blowtorch. With all those fires burning, it generated so much heat that it created its own circular patterns."

Upton said the Atlas Fire, which blasted through Napa Valley homes and wineries, threw embers way out in front, causing spot fires, and also occasionally formed fire whirls, but it didn't display as much wind power as the Tubbs Fire did.

"I've seen fires melt cars and literally reduce them to little more than metal and aluminum pooled on the ground," he said, but he hadn't seen destruction like he saw last week. "To flip a car over has to be some significant winds."

Peter Fimrite is a San Francisco Chronicle staff writer. Email: pfimrite@sfchronicle.com