



Fire Fight

Why are wildfires so frequent in California—and can they be stopped?

By Joshua Kors

Steve Matthews knows the science of fire. He teaches *thermodynamics*—the relationship of heat to other forms of energy—at Merritt College in Oakland, Calif. And 17 years ago, he lost everything he owned in a wildfire.

When Matthews and his wife saw the fire coming, they grabbed a few photo albums and fled. Returning the next day, there wasn't much they could do but sift through ashes. "The wheels on our new car were gone—the rims were just puddles of aluminum," he told *Current Science*. "And our house—there were bits

and pieces of recognizable things. We found the steel frame of one of the beds."

In 1991, many Californians regarded the Oakland fire, which destroyed more than 2,800 homes, as a freak occurrence. In recent years, however, massive wildfires, like earthquakes, have become a risk of living in California. In the past four years, California has lost

0.6 million hectares (1.5 million acres) to wildfires.

Last October, Americans saw the raw power of those invigorated fires up close, on TV, as parts of Southern California went up in flames. The fires consumed 202,000 hectares (500,000 acres) between Los Angeles and San Diego, destroyed 2,000 homes, and killed nine people.

Many Californians can't help but wonder what's feeding the savage fires and whether anything can be done to end them.

FIGHTING FIRE WITH FIRE

Tom Swetnam, a fire ecologist at the University of Arizona, says a disturbing combination of natural and human factors has set California aflame. The first factor, he says, is global warming. Temperatures in the West states have risen 1 degree Celsius (1.5 degrees Fahrenheit) on average since 1987. As the climate has warmed, forests have become drier and their branches and leaves more combustible. In the past 15 years, says Swetnam, California's fire season has increased by about 78 days.

Swetnam says the U.S. Forest Service deserves some blame as well. For decades, the government agency tried to stamp out every forest fire, an approach called *fire suppression*. But the move backfired. The Westem forests became packed with *fuel load* (living trees, dense brush, logs, and pine needles). "When fires occur, they ignite that fuel load," says Swetnam. "And after 100 years of fire suppression, there is a lot there to ignite. The fires get very intense and very large."

To reduce the fuel load, ecologists have led a shift in America's policy. Now firefighters set controlled fires. The idea is to clear the Westem forests of much of their brush so that when megafires arrive, they quickly die out from lack of fuel.

Alas, says Swetnam, controlled burns don't work everywhere in California. The hills of Southern California are overgrown with *chaparral*, dense thickets of shrubs and dwarf trees that regenerate with a alarming speed. As a consequence, controlled burns don't work as well there as they do in the ponderosa pine forests of Arizona and New Mexico. "With the chaparral landscapes of Southern California, controlled burns just aren't practical. Those forests are so dense, you can't really walk through them. And if you did burn them, it wouldn't create much of a barrier because chaparral comes back very quickly," says Swetnam. "Ecologically, it just doesn't make sense."

ILL WIND

Another contributor to the wildfire problem, says Volker Radeloff, a forest ecologist at the University of Wisconsin, is a lack of common sense among developers. "They're building houses in places of danger—in the forests or right up against them," he says. In California, about 5 million people live in homes in or near the wildlands.

"With these most recent fires, and the evacuation of a million people, it should be clear: These wildfires



are more than just a nuisance," says Radeloff. "They're a serious danger and should be treated as such."

Southern California's firefighters must also contend with the *Santa Ana* winds. Those are strong bursts of dry air that blow east to west from the high deserts of Nevada over the San Gabriel Mountains and down the canyons into California. The Santa Anas provide the megafires with the oxygen they need to thrive. And their powerful gusts, moving at speeds of up to 80 kilometers (50 miles) per hour, can toss flaming needles and branches into the distance, starting new fires as far as a mile from a mega fire.

Caught between runaway development, global warming, and the Santa Ana winds, California's firefighters face a tough challenge, Radeloff says. To keep the situation from getting worse, he says, communities should forbid the construction of houses in danger zones. And, he adds, families would do well to educate themselves about forest fires.

After the 1991 fire, Matthews started a community group to provide his neighbors with information about wildfires. Understanding how fires start and how they spread is a form of security, he says. "It's important to be prepared in case there's another fire down the road." **CS**



Above: a house destroyed by fire
Left: A teenage boy sleeps in a stadium after being evacuated from his home.

All images: AP Images; Map: NCT/Newscom; Sources: MODIS, USDA Forest Service