

Menaced by flames, nuclear lab peers into future of wildfire

May 14 2022, by Morgan Lee



A haze of wildfire smoke hangs over the Upper Rio Grande valley and the mesa-top city of Los Alamos, N.M., on Thursday, May 12, 2022. Public schools and many businesses were closed as a wildfire crept closer to the city and companion national security laboratory. Scientists at Los Alamos National Laboratory are using supercomputers and ingenuity to improve wildfire forecasting and forest management amid drought and climate change in the American West. Credit: AP Photo/Morgan Lee

Public schools were closed and evacuation bags packed this week as a stubborn wildfire crept within a few miles of the city of Los Alamos and its companion U.S. national security lab—where assessing apocalyptic threats is a specialty and wildland fire is a beguiling equation.

Lighter winds on Friday allowed for the most intense aerial attack this week on those flames west of Santa Fe as well as the biggest U.S. wildfire burning farther east, south of Taos.

"We had all kinds of aviation flying today," fire operations chief Todd Abel said at a Santa Fe National Forest briefing Friday evening. "We haven't had that opportunity in a long time."

In Southern California, where a fire has destroyed at least 20 homes south of Los Angeles in the coastal community of Laguna Niguel, Orange County emergency officials scaled back the mandatory evacuation area Friday from 900 residences to 131.

People who remained on alert to prepare for evacuations west of Santa Fe included scientists at Los Alamos National Laboratory who are tapping supercomputers to peer into the future of wildfires in the U.S. West, where [climate change](#) and an enduring drought are fanning the frequency and intensity of forest and grassland fire.

The research and partnerships eventually could yield reliable predictions that shape the way vast tracks of national forests are thinned—or selectively burned—to ward off disastrously hot conflagrations that can quickly overrun cities, sterilize soil and forever alter ecosystems.



A storefront window announces a work hiatus on Thursday, May 12, 2022, as residents of Los Alamos, N.M., prepared to possibly flee a wildfire as it crept within a few miles of the city and companion national security laboratory. Scientists at Los Alamos National Laboratory are using supercomputers and ingenuity to improve wildfire forecasting and forest management amid drought and climate change in the American West. Credit: AP Photo/Morgan Lee

"This actually is something that we're really trying to leverage to look for ways to deal with fire in the future," said Rod Linn, a senior lab scientist who leads efforts to create a supercomputing tool that predicts the outcome of fires in specific terrain and conditions.

The high stakes in the research are on prominent display during the furious start of spring wildfire season, which includes a blaze that has

inched steadily toward Los Alamos National Laboratory, triggering preparations for a potential evacuation.

The lab emerged out of the World War II efforts to design nuclear weapons in Los Alamos under the Manhattan Project. It now conducts a range of national security work and research in diverse fields of renewable energy, nuclear fusion, space exploration, supercomputing and efforts to limit global threats from disease to cyberattacks. The lab is one of two U.S. sites gearing up to manufacture plutonium cores for use in [nuclear weapons](#).



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Laboratory are using supercomputers and ingenuity to improve wildfire forecasting and forest management amid drought and climate change in the American West. Credit: AP Photo/Morgan Lee

With nearly 1,000 firefighters battling the blaze, laboratory officials say critical infrastructure is well safeguarded from the fire, which spans 67 square miles (175 square kilometers).

Still, scientists are ready.

"We have our bags packed, cars loaded, kids are home from school—it's kind of a crazy day," said Adam Atchley, a father of two and laboratory hydrologist who studies wildfire ecology.

Wildfires that reach the Los Alamos National Laboratory increase the risk, however slightly, of disbursing chemical waste and radionuclides such as plutonium through the air or in the ashes carried away by runoff after a fire.

Mike McNaughton, an environmental health physicist at Los Alamos, acknowledges that chemical and radiological waste was blatantly mishandled in the early years of the laboratory.



Teenage boys wait for a public bus after a pickup game of soccer in Los Alamos, N.M., on Thursday, May 12, 2022, during a weeklong public school closure because of nearby wildfire. The blaze has been creeping closer to the mesa-top city and companion Los Alamos National Laboratory that analyzes global threats of disease, warfare and natural disasters. Scientists at Los Alamos are using supercomputers and ingenuity to improve wildfire forecasting and forest management amid drought and climate change in the American West. Credit: AP Photo/Morgan Lee

"People had a war to win, and they were not careful," McNaughton said. "Emissions now are very, very small compared with the historical emissions."

Dave Fuehne, the laboratory's team leader for air emissions

measurement, says a network of about 25 air monitors encircle the facility to ensure no dangerous pollution escapes the lab unnoticed. Additional high-volume monitors were deployed as fire broke out in April.

Trees and underbrush on the campus are removed manually—3,500 tons (3,175 metric tons) over the course of the last four years, said Jim Jones, manager of the lab's Wildland Fire Mitigation Project.

"We don't do any burning," Jones said. "It's not worth the risk."

Jay Coghlan, director of the environmental group Nuclear Watch New Mexico, wants a more thorough evaluation of the lab's current fire risks and questions whether plutonium pit production is appropriate.



The Cerro Pelado Fire, seen Friday, May 6, 2022, from Cochiti, N.M, burns in the Jemez Mountains. (Robert Browman/Albuquerque Journal)/The Albuquerque Journal via AP)

This year's spring blazes also have destroyed mansions on a California hilltop and chewed through more than 422 square miles (1,100 square kilometers) of tinder-dry northeastern New Mexico. In Colorado, authorities said Friday one person died in a fire that destroyed eight [mobile homes](#) in Colorado Springs.

The sprawling fire in New Mexico's Sangre de Cristo Mountain range is the largest burning in the U.S., with at least 262 homes destroyed and thousands of residents displaced.

Nearly 2,000 fire personnel are now assigned to that fire with a 501-mile (806-kilometer) perimeter—a distance that would stretch from San Diego to San Francisco.

Atchley says [extreme weather conditions](#) are changing the trajectory of many fires.

"A wildfire in the '70s, '80s, '90s and even the 2000s is probably going to behave differently than a wildfire in 2020," he said.



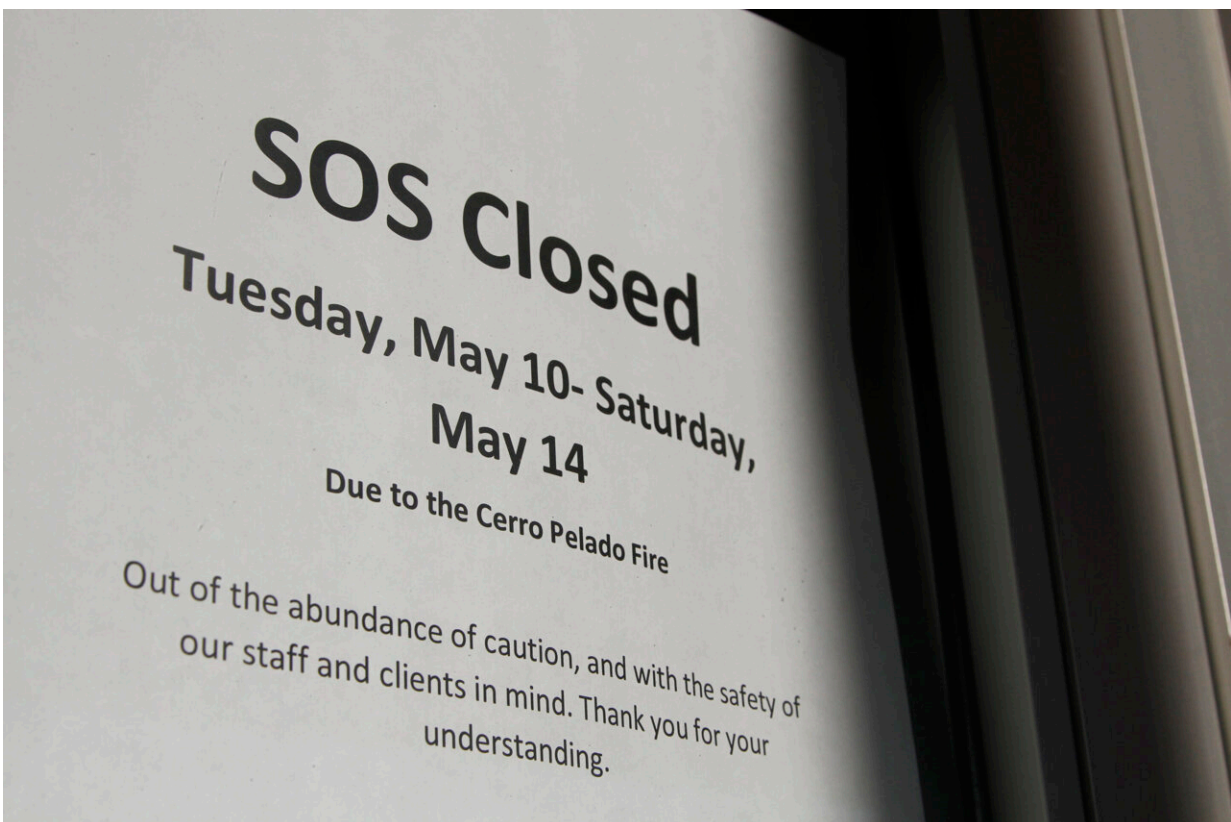
Families flocked to a public park in downtown Los Alamos, N.M., on Thursday, May 12, 2022, during a weeklong public school closure because of nearby wildfire. The blaze crept has been creeping closer to the mesa-top city and companion Los Alamos National Laboratory that analyzes global threats of disease, warfare and natural disasters. Scientists at Los Alamos are using supercomputers and ingenuity to improve wildfire forecasting and forest management amid drought and climate change in the American West. Credit: AP Photo/Morgan Lee

Atchley says he's contributing to research aimed at better understanding and preventing the most destructive wildfires, superheated blazes that leap through the upper crowns of mature pine trees. He says climate change is an unmistakable factor.

"It's increasing the wildfire burn window. ... The wildfire season is year-round," Atchley said. "And this is happening not only in the United States, but in Australia and Indonesia and around the world."

He's not alone in suggesting that the answer may be more frequent fires of lower intensity that are set deliberately to mimic a cycle of burning and regeneration that may have take place every two to six years in New Mexico before the arrival of Europeans.

"What we're trying to do at Los Alamos is figure out how do you implement prescribed fire safely ... given that it's exceedingly hard with climate change," he said.



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crept within a few miles of the city and companion national security laboratory. Scientists at Los Alamos National Laboratory are using supercomputers and ingenuity to improve wildfire forecasting and forest management amid drought and climate change in the American West. Credit: AP Photo/Morgan Lee



Firefighters and residents stand on a fire road where the Coastal Fire jumped and burned several homes Thursday, May 12, 2022, in Laguna Niguel, Calif. Credit: AP Photo/Marcio Jose Sanchez



A plane drops fire retardant onto the Coastal Fire Thursday, May 12, 2022, in Laguna Niguel, Calif. Credit: AP Photo/Marcio Jose Sanchez



This satellite image provided by Maxar Technologies shows the active fire lines of the Hermits Peak wildfire, in Las Vegas, New Mexico, on Wednesday, May 11, 2022. Wildfire in the West is on a furious pace early this year. Wind-driven flames tearing through vegetation that is extraordinarily dry from years-long drought exacerbated by climate change has made even small blazes a threat to life and property. Credit: Satellite image ©2022 Maxar Technologies via AP



Sassan Darian holds his cat Cyrus as he stands in front of his family's fire-damaged home in the aftermath of the Coastal Fire Thursday, May 12, 2022, in Laguna Niguel, Calif. Credit: AP Photo/Marcio Jose Sanchez

Examples of intentional prescribed burns that escaped control include the 2000 Cerro Grande Fire that swept through residential areas of Los Alamos and across 12 square miles of the laboratory—more than one-quarter of the campus. The fire destroying more than 230 homes and 45 structures at the lab. In 2011, a larger and faster-moving [fire](#) burned fringes of the lab.

Atchley said the West's forests can be thought of and measured as one giant reserve that stores carbon and can help hold climate change in check—if extreme fires can be limited.

Land managers say expansive U.S. national forests can't be thinned by hand and machine alone.

Linn, the physicist, says wildfire modeling software is being shared with land managers at the U.S. Forest Service, as well as the Geological Service and Fish and Wildlife Service, for preliminary testing to see if can make prescribed fires easier to predict and control.

"We don't advocate anybody using any of these models blindly," he said. "We're in that essential phase of building those relationships with land managers and helping them to begin to make it their model as well."

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