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## **S.D. COUNTY WILDFIRES**

### Avalanche of images and data gave firefighters an advantage

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The smoke has yet to clear on the question of why certain military aircraft weren't available in the early stages of the October wildfires.

But as the postmortems proceed, details have emerged about how cutting-edge imagery and technology – much of it provided for free by the military – helped the firefighting effort.

For what may be the first time in U.S. firefighting history, commanders directing aircraft and fire engines had access to a barrage of photos, videos, infrared views and data fed from airborne cameras and sensors to sophisticated software on the ground.

“We were working with some of the highest-tech equipment the military has, the same stuff they're using in Iraq,” said state Fire Marshal Kate Dargan of Cal Fire, who helped coordinate the flow of information.

The images and data were blended into maps that were used to send fire hoses, aerial loads of water and fire retardants where they were needed most.

“It was the first time that civilian fire departments had worked so closely with the Department of Defense and National Guard,” Dargan said.

There was a problem, however: It took several days for the bulk of the high-tech apparatus to arrive.

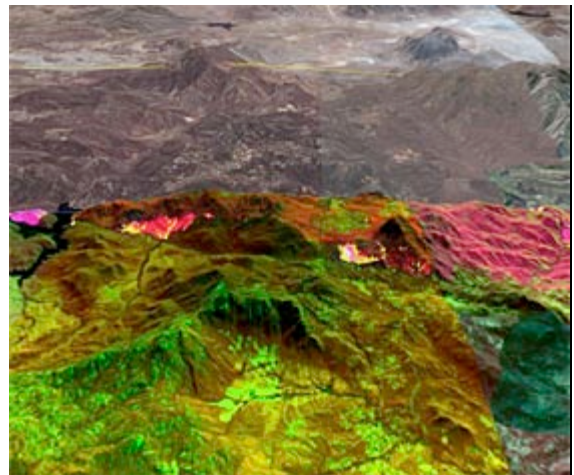
By that time, much of the fiery chaos that eventually took 10 lives, destroyed more than 1,700 homes, burned more than 200,000 acres and forced the evacuation of 500,000 residents had played out.

Dargan conceded that critical hours were lost getting military planes from out of state and getting information specialists on board from offices as far away as Virginia and Colorado.

She said many lessons and questions about military/fire-service agreements have emerged from the wildfires. Gov. Arnold Schwarzenegger has requested that the state Department of Forestry and Fire Protection and other state officials give him an “unvarnished review” of actions taken during the fires.

Ron Roberts, one of several local leaders who began pushing for more cooperation after the 2003 wildfires, said the effort this time was too little and too late to be truly effective.

Before the equipment arrived, “incident commanders were making their best guesses, but nobody had that



Courtesy of NASA  
NASA Predator drone data taken last month and overlaid on a Google map show wildfires in part of the county. Active fires appear yellow or red, burned areas are dark red or purple, and unburned areas are in green.

bird's-eye view," said Roberts, chairman of the San Diego County Board of Supervisors.

"The response was slower than you would like for as serious an emergency as it was. We're focused now on how we can do better next time."

Roberts has been encouraged by briefings from experts at San Diego military contractors SAIC and Northrop Grumman Corp. about the possibility of adapting more "look-down technology" to fighting wildfires.

But he cited potential obstacles such as turf wars, budget jealousies, rigid bureaucracies within government at all levels and existing contracts with private companies.

Then there is the question of what it all will cost.

"We need to show the public what is available in the high-tech area and determine which of these tools work best and which are doable here," Roberts said. "Maybe then we can get the funding issue onto a ballot."

### **'Bucket of information'**

Seeds of the partnership that sprang up between firefighters and the military last month were sown during two years of discussions after the Cedar fire. Formal agreements weren't in place, so arrangements to share information and equipment were made on the fly.

What transpired during the week of the October fires could be used as a foundation for a national model of how disaster management should occur, Dargan said.

The images came from a variety of sources, including Air Force reconnaissance aircraft, an Air Force Global Hawk spy plane, Navy and National Guard surveillance aircraft and NASA's Predator drone. Visuals also came from local fire and police helicopters.

The images and data were fed into "a technological catcher's mitt, a big bucket of information from which everyone could pull out what was useful," Dargan said.

Fire commanders used the information, and so did computer experts at San Diego State University who worked with far-flung volunteers to turn the information into useful maps that were posted on the Internet and used in TV reports.

Eric Frost, who co-directs SDSU's Visualization Center, said he was particularly struck by the images from the unmanned Predator, which flew over the wildfires on 10-hour missions over four days.

"You could see all these new fires breaking out ahead of the main fire," Frost said. "It was profoundly sobering to see how dangerous it is for firefighters who are trying to fight along a fire line, and balls of fire are just shooting over them and starting new fires behind them."

### **Futuristic thinking**

Bill Clayton, a retired Cal Fire chief who oversaw operations in the 2003 fires, said it's only logical to use military technology to fight fires.

"Military and firefighting operations are parallel," Clayton said. In both, thick smoke and rapidly changing situations and conditions can have commanders flying blind through the skies and confused on the ground.

In the fires that swept through San Diego County in 2003, the job of coordinating the efforts of thousands of fire crews, fire engines and aircraft was done on overloaded radio channels and with a great deal of guesswork, Clayton said.

So in 2004, he eagerly accepted an invitation from the Army to visit Iraq and see the "command center of the future" in action in Baghdad.

Based on that experience, Clayton envisioned a scenario in which sensors and digital cameras fixed to towers

could detect backcountry fires almost immediately, relaying data on wind, humidity and the intensity of the fire.

Infrared cameras and sensors on aircraft could then feed the information to computers whose software would meld it with interactive maps showing topography and the likely behavior of the fire, Clayton said.

“You can glance at the computer screen and see a hot spot, know the wind speed and direction and immediate fuel load, the grade of the terrain, the nearest fire apparatus and their capabilities, whether aircraft can be brought in, etc.,” said Clayton, who now consults with local and state fire officials.

“You know when a fire crew might be overrun by flames even though they can't see the danger because it's too smoky or it's dark. And they have all have laptops and can see it, too.”

Dargan, the state fire marshal, said that at this point far more has been accomplished in adapting military technology to “the intelligence side of things” than to actual firefighting.

She said there has been talk about using blimps, firefighting jets with big water canons or even Tomahawk missiles loaded with fire retardant. But so far, such ideas are more imagination than reality.

“Firefighting is still about putting water on the fire,” Dargan said. “For now, we have ground assets and certain air assets, and that's what we use.”

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■Staff Writer Bruce V. Bigelow contributed to this report.

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