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## Robots can be lifesaving rescue workers

### Robotic aircraft play a role in assessing Katrina's damage

By Marsha Walton  
CNN

Thursday, September 15, 2005; Posted: 5:00 p.m. EDT (21:00 GMT)

**TAMPA, Florida (CNN) -- They look like big, high-tech toys. But robotic airplanes and helicopters with cameras, microphones and sensors can provide crucial information for emergency responders in the aftermath of disasters like Hurricane Katrina.**

"You don't even have to wait until dawn the next morning to start flying to get a view of where the damage is, what areas have been hit hardest, what roads are still open, and how to get access to them," said Robin Murphy, director of the Center for Robot Assisted Search and Rescue (CRASAR).

Murphy, a professor in the department of computer science and engineering at the University of South Florida, used the unmanned aerial vehicles in Pearlington, and Bay St. Louis, Mississippi a couple days after Katrina hit the Gulf Coast.

The robotic aircraft can fit in two suitcases and can be assembled and launched in about 15 minutes. Murphy says they can be most valuable in the hours immediately following a natural disaster when lives can still be saved. After a hurricane, that would mean scanning rooftops for survivors, and doing triage to get to the most fragile people first.

"If you see a family of five with two toddlers, they are a lot more vulnerable and in need of rescue than four or five guys who were having a hurricane party and can probably stay out for another six hours, worse come to worse," said Murphy.

But like many groups who tried to get to

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New Orleans after the hurricane, Murphy and her team ran into obstacles in their attempt to help.

"Katrina was a series of frustrations, and a series of wonderful things from a scientific perspective," she said.

Rescue experts at Louisiana State University, familiar with the capabilities of these robots, asked for help from Murphy and her colleagues a day after the storm. They got within three miles of New Orleans, but could not get any closer.

"We could not get an escort into the city, and of course by Wednesday afternoon we were already having carjackings, lootings, a lot of shootings, it was very clear there was civil unrest," she said. So the scientists were forced to leave Louisiana.

But still determined to assist, Murphy offered the robotic tools to Mississippi officials. In Pearlington, the aircraft got a bird's eye view of a part of the town that human rescue workers had been unable to evaluate.

"So we launched, we looked up, we could see that the floodwaters had receded, that nobody was on the roof trapped. There was a tremendous amount of damage, but mostly the people were in a position that they could walk out and get help, and that rescuers, and humanitarian assistance could walk in and get to them," she said.

The fixed wing aircraft work best between 100 and 400 feet in the air, above the tree line, but below regulated airspace. They can provide a "big picture" of the devastation in an area.

The helicopters stay much closer to the ground, able to peer into windows to look for victims or, after survivors have been rescued; to document structural damage; and look for environmental problems.

Search robots earned credibility after the 9/11 attacks in New York, Virginia and Pennsylvania.

"At the World Trade Center we saw the first use of ground robots, they could go underneath, go into places that people and dogs simply couldn't fit into or that were still on fire. They could do things that people just couldn't or shouldn't do," she said.

But each disaster, natural or manmade, is different. The ground robots that proved valuable in the confined rubble of the Trade Center could not offer the big picture after a hurricane.

"The big thing that we learned from Hurricane Charley (in Florida in 2004) is that it is a geographically diverse, very wide, distributed event. You need to be able to see what's going on beyond that tree that's down, what's on top of that building? Do we know if everybody's out of there?"

Ground robots have been helpful in other aspects of search and rescue since Katrina hit. Mark Micire, a technical search specialist for Florida Task Force 3, used a small, sturdy bot to search an apartment building in Biloxi, Mississippi.

"The storm surge had come in and basically damaged the first floor of this apartment complex," said Micire.

"The engineers there determined it was unsafe for any of our rescue personnel to enter, and so what we did was set up at the curb and ran [the robot] from the front door to the back door of that structure, and fairly confidently told our team leader that there were no victims in that building," he said.

Micire, the president of American Standard Robotics in St. Petersburg, Florida, designs robots for search and rescue and other industrial uses, like checking for gas leaks, chemical and biological hazards.

Both skittishness about new technology and the slow pace of government action have

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kept the adoption of robotic tools from happening quickly by either states or the federal agencies.

"Emergency responders typically look at new equipment with a little bit of cynicism. You can imagine how much equipment is touted as 'solving all of their problems,'" said Murphy.

She spends much of her time out of the lab and in the field with the first responders who have to deal with the stress, danger, and immediacy of a disaster. Letting them observe and then operate the equipment helps researchers tweak the design.

For instance, future helicopter robots will be equipped with two-way audio, so people trapped or waiting for rescue can communicate with rescue crews.

Murphy says it takes an average of seven to eight years before either the federal or state governments get their hands on a new technology.

"Think about your office, anything in your house, do you have anything that is seven years old? Your computer isn't, your DVD isn't, your TV is not," she said.

In spite of the frustrations in New Orleans, Murphy is optimistic about how robots will eventually help rescue crews, highway engineers, even architects in the short and long term after a disaster.

"We walked away with a sense of, this is all beginning to come together, that it can be a radical, positive change in the technology that emergency responders can use and can save lives, and help them work more efficiently," said Murphy.

*CNN's Daniel Sieberg contributed to this report.*

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