



MIRANDA MILLER leads the GIS team at the Robert Fire camp. She works out of a trailer that supplies all of the technological support for the fire command team.

Dave Reese/ Daily Inter Lake **High-tech tools**
map wildfires

In the fight against wildfire, shovels and axes are being joined as tools of choice by a tiny device that fits in the palm of a hand.

In an air-conditioned trailer on the edge of the Robert Fire camp, five people sit at their laptops pecking at their keyboards. On the walls are large, colorful maps of the fire — all created with information gained through Geographic Information Systems.

Information is gained by people on the ground and in the air using small handheld Global Positioning System, or GPS, devices. The small consumer-grade GPS units used by hunters and hikers are used to track fire growth, record where bulldozers have laid fire lines, and help predict where the fire is going.

The maps, crucial to the firefighting effort, couldn't be created without the hand-held devices, says Dave Brownlie, Situation Unit Leader on the Robert Fire.

Each day when mapping the perimeter of a fire, technicians with Garmin GPS units "fly low and slow" over the fire in a helicopter and record the fire's edge with a push of a button, Brownlie said. Other features, such as hot spots, bear dens or historic landmarks, are recorded as way points. This information, accurate to within five feet, can then be shared with other agencies, like Montana Fish, Wildlife and Parks or the National Park Service.

Back at the trailer the information from the GPS units is downloaded onto computers and used in mapping. The move to GIS is a big change from only a few years ago, when fire analysts used markers and plastic map overlays to monitor a fire's growth. They flew over the fire and marked out the fire's path on paper, but the process was "very difficult to do," Brownlie said. "You didn't go very far before you were disoriented and had to start over.

"It was usually a very incomplete picture of the fire."

The GIS teams still send people out on the ground with GPS units to record where fire lines have been dug, or "anywhere a dozer blade has touched the ground," Brownlie said. This information is stored electronically so that fire rehabilitation crews know exactly where to work. Brownlie, from Tallahassee, Fla., is part of the Southern Incident Command team running the Robert Fire.

Information gained from the GPS units is complemented with data gained on night flights. Each night when the fire dies down, aircraft hired by the federal government fly overhead in the darkness, shooting pictures of the fire using an infrared scanner.

The aircraft land at a local airport and hand over the digital information, which is then uploaded to a File Transfer Protocol site for retrieval at fire command.

By morning, fire officials get an infrared picture of fire's growth, including any hot spots. Brownlie said this was especially useful last Sunday, when the Robert Fire made a 7,000-acre run in one day.

"The IR (infrared) became absolutely essential," he said. "The heat center was pretty impressive." Because of the large amount of smoke, the only way fire officials could get a handle on the fire's growth was the infrared information, Brownlie said.

"They make our jobs safer and technically more efficient," said Roger Fryar, a GIS leader with the Southern Incident Command team.

Fryar is known around fire camp as "Inspector Gadget," because of all the high-technology gizmos he carries around. One is an Ipaq Pocket PC, which he uses to store millions of bits worth of aerial maps and satellite imagery about the fire.

Map-reading skills are still good to have, despite the move to a digital mapping system, Fryar said, "but the GPS has made it a lot easier for people to find out where they are without having to find themselves on a map."

Dave Williams is the owner of Lightning Ridge Technologies, the company that provides the trailer and computers for the GIS team. He started his business two years ago to provide services to fire teams that use GIS.

Inside the Lightning Ridge trailer earlier this week, a team of specialists worked on the map that would be used for the evening shift's review of the day's fire progress. The map is part of the Incident Action Plan that guides firefighting efforts.

Miranda Miller, a GIS expert with the U.S. Fish and Wildlife Service, spent years as a crew boss on fire lines before making the transition to the air-conditioned comfort of the GIS trailer.

For instance, when she teaches the finer points of map making, she tells them simple things, like not to put legends over fire lines. "It really helped to have time on the line," she said. "You don't worry about being artistic as much as providing the information."

The appearance of technology-laden trailers like the one from Lightning Ridge is fairly new at fire command centers. Miller, a GIS team leader from Texas, said she appreciates being able to have all of the tools she needs at her fingertips, as opposed to working out of a van, a local church or a school hallway. "We were always worried about power or supplies running out," she said. "This allows us to get a lot more done."

As the wealth of digital information grows, it will make firefighters' jobs easier. Last year's fire in Hammond, Colo., was evidence of that. By using digital information gained through GIS, the firefighters knew exactly where residential structures were located, making evacuations more efficient, "instead of us driving around counting mailboxes," Miller said.

