Map system adds new contour to crises

Mapping software, satellites give rescuers a key tool to help manage relief efforts when disaster strikes

GRANT BUCKLER
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In the midst of an emergency it's often hard to see the big picture. Yet that's just what emergency workers need to do -- and one of the best forms in which to see it is a map.

During recent severe flooding in Kenya, volunteers from MapAction, a British not-for-profit organization that specializes in satellite map imagery, were called in to help the humanitarian relief effort. Equipped with laptops and geographic information system (GIS) software, the group helped relief workers and the Kenyan government identify the worst-hit areas and move resources quickly to where they were needed most, says Nigel Woof, MapAction's operations director.

The real value of the maps, Mr. Woof explains, is they provide supplemental -- and timely -- data, such as what roads are impassable, where the dead and injured are and which areas have humanitarian teams in place. "The great thing about a GIS system is you can update information very quickly."

More and more, relief groups and rescue organizations are turning to satellite-based mapping that can give them a bird's-eye view of a disaster area. GIS software can provide such life-saving information as which way winds are blowing a forest fire, a way of identifying and contacting people who live in an affected area and where food and shelter are available.

Enlarge Image

Flooding in November 2006 in Kenya required humanitarian intervention from the UNHCR, who in turn called on U.K.-based MapAction to provide support with their satellite-based mapping system. *(UN)*

Since 2003, MapAction teams, typically comprising five to 10 volunteers, have prepared maps for dozens of humanitarian agencies that have responded to catastrophes such as the Asian tsunami late in 2004 and the Kashmir earthquake in 2005.

The first extensive use of electronic mapping in a Canadian disaster came during the Manitoba flooding in 1997, says Alex Miller, president of ESRI Canada, a unit of Redlands, Calif.-based Environmental Systems Research Institute, Inc. Geographic information system software has played a role in emergency response for many years, says Mr. Miller, but the ability to share information electronically has expanded its role and made it more visible.

In the last three or four years, high-speed Internet connections have improved emergency teams' access to up-to-the-minute information, says Ron Lake, chief executive officer of Vancouver-based Galdos Systems Inc., which makes software for sharing geographic data.

During record flooding in Alberta in 2005, for example, Emergency Management Alberta relied on a GeoExplorer system from Telus Geomatics, a unit of Burnaby, B.C.-based Telus Corp., to manage relief efforts. Rick Brown, acting executive director of the provincial agency, says EMA superimposed more than 375 layers of data on maps of the province that showed current weather conditions, the latest information on homes evacuated as well as the location of roads, waterways, oil and gas wells, residences and other infrastructure.

Before GIS, the agency relied on paper maps tacked up on walls and people in the field calling in information. Numbers written on maps would correspond to notes on separate situation boards, a process that proved to be slow and cumbersome.

But with the GIS system, which EMA has used for about three years, the agency can combine information from many sources quickly, Mr. Brown says. "We have the ability to put the picture within our emergency operations centre."

Jim Huff, general manager of Telus Geomatics, says some Alberta gas companies use Telus Geomatics systems in case of gas leaks. They use weather data to see which way gas will drift, Mr. Huff says, then identify homes most likely to be affected and call them using a phone-number database integrated with the mapping system.

In an emergency, seeing the big picture quickly can save lives.

How it works:

A geographic information system can store, manipulate and display geographic data in map form. It is used in everything from urban planning to disaster relief efforts.

A GIS company will capture real-time satellite images from space and store them on its servers. It will then beam those images by satellites to laptop-equipped personnel in a remote disaster zone.

Data collected by field teams can then be used to update maps and co-ordinate target-specific relief efforts.

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