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Which Way to the National Grid?

By Jessica Sperlongano

■ As FEMA discovered in New Orleans, it's hard to help somebody if you can't find them on a map, or if the street signs are washed away.

Four years before Hurricane Katrina flooded New Orleans, the Federal Emergency Management Agency endorsed a plan for the "National Grid," a unified mapping system to help emergency responders navigate a city where the street signs and other landmarks are submerged, blown down, or washed away. At the time, FEMA said that the grid would "help save lives, reduce the costs of disaster, and enhance preparedness, response, recovery, and mitigation efforts." In December 2001, a federal interdepartmental committee that studies mapping adopted the National Grid as the standard for federal agencies.

But when Katrina ripped through the Gulf Coast, FEMA didn't use the grid. Rescuers were left scrambling for usable maps to get them where they needed to be.

Two days before Katrina hit land, mapping specialist Talbot Brooks brought a small group of students from Delta State University to the Emergency Operations Center in Jackson, Miss., also carting computers equipped with mapping technology. Brooks, the director of the Center for Interdisciplinary Geospatial Information Technologies at the university, figuring that the emergency center had a mapping division, said his group was ready to help. "This assumption proved untrue," Brooks said. His group of five quickly turned into 60 volunteers who were on call 24 hours, creating basic maps. As Brooks soon realized, FEMA's mapping specialist at the center didn't have the necessary software to create, store, or analyze geographic information.

Mapping problems bedeviled the Mississippi Delta K-9 Search-and-Rescue Unit, sent from Jackson to locate victims in Hancock County, 40 miles east of New Orleans. The unit's dogs could sniff out people in trouble, but only if the handlers could find the targeted location. One day, said Assistant Chief Shane Henderson, "we completely could not find the area" that needed to be searched—because the mapping software didn't work. Finally, other rescuers used cellphones to direct Henderson's unit to the right spot.

According to Brooks and other proponents, the National Grid would have prevented these problems if authorities had taken steps to train federal, state, and local responders during the four years between the grid's adoption and Katrina's devastation. The National Grid is a mapping system based on coordinates provided by satellite imagery. It can be displayed like any other digital map (think Google maps) on a Global Positioning System device. Each point in the country has a unique 15-digit grid address. Instead of entering a physical address (street and ZIP code), users input a single string of letters and numbers into a handheld GPS unit that can give directions within one meter of a location. All GPS units are programmed with the National Grid (or the compatible military grid). Users just have to switch their unit to the proper format to find a grid address.

The National Grid is compatible with all military mapping systems, but it is useless unless rescue workers know how to read it. Although the grid is the official standard, not all federal agencies follow it, and few local responders have been trained to use it.

"While it may be true that FEMA and other federal agencies have adopted" the National Grid, Brooks said, "the standard has not been implemented by the agency or in the emergency management sector."

According to FEMA press secretary Aaron Walker, the agency does use the National Grid—but it didn't during Katrina because most state and local agencies depended on street addresses or on latitude and longitude coordinates. "There certainly are maps for which we use National Grids; there's also maps for which we don't," Walker said.

The grid is the brainchild of the Public XY Mapping Project, a group of specialists who recognized the need for spatial mapping after Hurricane Andrew in 1992. Latitude and longitude measurements can be confusing (two strings of coordinates that can be read in three different ways) or, as Henderson found, inaccurate. The mapping project says the National Grid is an easier system to learn.

Not all local responders even have GPS units, however. Some, such as the New Or-

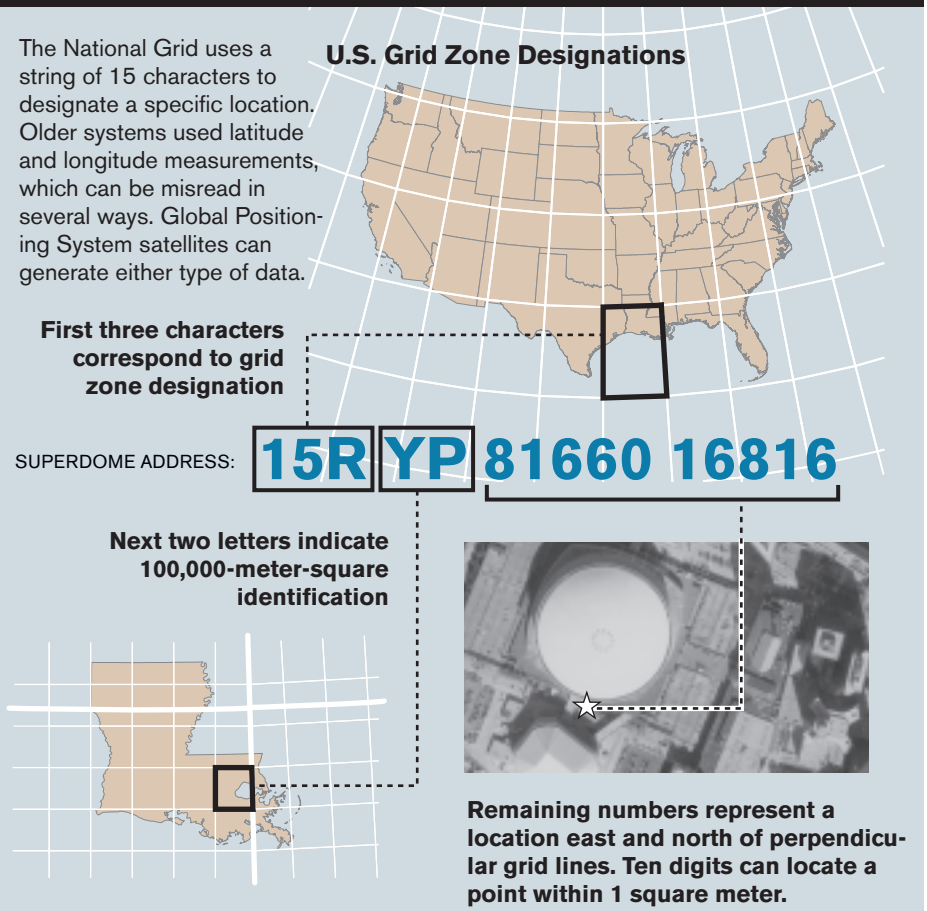
■ Aftermath

AFP/GETTY/ROBERT SULLIVAN

■ Hurricane Katrina redrew the map for emergency workers in Mississippi and along the Gulf Coast.

Finding the Superdome on the Grid

The National Grid uses a string of 15 characters to designate a specific location. Older systems used latitude and longitude measurements, which can be misread in several ways. Global Positioning System satellites can generate either type of data.



leans Fire Department, use paper maps and municipal addresses to respond to rescue calls. The department had not trained its firefighters to use coordinate-based mapping, so when first responders from FEMA and the military got to Louisiana, they had to set up their own mapping systems.

FEMA responders had a different problem in Mississippi. "They were relying on us to print map products that they would arrange for from Washington," Brooks said. But the maps that FEMA sent to Brooks were not in proper mapping format; they came as PowerPoint slides that his team had to convert into maps and then into coordinates. The FEMA mapping specialist never mentioned the National Grid, Brooks said, even though it would have helped significantly.

"Nobody really thought about maps ahead of time—like the need for hundreds of basic street maps of the coastal county areas for responders not from the local area," according to Brooks. Many of the maps that responders finally got lacked coordinate references or differed from version to version, making it difficult for Brooks and his team to provide accurate assistance.

In New Orleans, FEMA and military responders relied on their own mapping systems to navigate the city, instead of the fire department's paper maps. But even FEMA and the military were using conflicting systems, according to fire department Capt. Richard Smith. The military computer allowed the input of four-digit coordinates to create a map, but FEMA had a different set of coordinates that the military computers could not process. In order for the military units and FEMA to work from the same mapping coordinates, "they had to convert every GPS number over to a military number," Smith said.

Since FEMA was not using the National Grid, Smith had to generate a physical address for a 911 call, send a map to Coast Guard officials, and then wait while they plotted military grid coordinates, before both could respond. Throughout the rescue effort, Smith continued to distribute paper maps to civilian responders on the ground. "They were mostly firemen," Smith said. "They could read a map, so we gave them a map."

The "National Grid is still a few years off as far as widespread adoption," FEMA spokesman Butch Kinerney said, citing the example of Virginia's Loudoun County, where he is a volunteer firefighter. There, the department is just beginning to switch from map books to latitude and longitude coordinates. "The feeling right now is that [the National Grid is] not something to push down on them until it gets more widespread acceptance."

Elsewhere in the country, though, emergency workers and law enforcement officers have found success with the National Grid.

The Skagit County Sheriff's Office in Mount Vernon, Wash., uses the grid to collaborate with the local National Guard on marijuana eradication. Since both are working from compatible maps, National Guard aircraft can fly over the county and communicate the location of marijuana farms to officers waiting on the ground to move in.

Sean Carson, a mapping specialist in Skagit County, said that former military personnel in the sheriff's office requested maps with National Grid references because of their similarity to the military grid. "It is pretty straightforward and simple to learn, in my opinion," Carson said. "It is the simplest grid system to communicate coordinates back and forth."

Carson said he thinks that adoption of the National Grid is slow because, like in New Orleans, most local responders have created their own grids, not realizing that during a catastrophe, outsiders may not be able to understand the system. "I don't think that there's a lot of forward thinking in that manner," Carson said.

Brooks, for one, hopes to change that by teaching his students to use the National Grid. "It seems ridiculous that so much energy and effort went into developing the [National Grid] and it sits on the shelf because training and education have not taken place," he said. "It does work—the military has been using the same basic system for decades." ■

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