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Testing new technologies for disaster response

GeoSHAPE, a software application designed to revolutionize the way organizations collaborate in response to disasters, can display disaster-relevant information in a map that anybody with a web browser and the appropriate permissions can see from anywhere in the world.

Other | 5 September 2014



During a hurricane simulation, disaster managers from the Honduras' Permanent Contingency Commission, as well as representatives from the Honduran Red Cross, Firefighters, Military, Police and other organizations use GeoSHAPE to share information and support informed decision making. SOUTHCOM's Science, Technology and Experimentation Division conducted the demonstration of GeoSHAPE in Honduras, from 10-12 June, 2014. [Photo: USSOUTHCOM's Science, Technology and Experimentation Division]

A category 5 hurricane hits Honduras just before sunset, tormenting towns and people along its path. Behind, it leaves a toll of roofless houses, truncated lives, and thousands left with nothing but the hope of getting help quickly... now.

Fortunately, Hurricane Gonzalo was only a figment of the imagination, the “perfect storm” crafted by the Science, Technology and Experimentation Division at the United States Southern Command (USSOUTHCOM) and Honduras' Permanent Contingency Commission (COPECO) to demonstrate and



U.S. military personnel utilized GeoSHAPE during a hurricane response exercise at Soto Cano Air Base, Honduras, 12 June, 2014, to document the route to the simulated medical site, label obstructions found on their way and share that information to provide situational awareness to other users. [Photo: U.S. Air National Guard Captain Steven Stubbs]

response to disasters.

Take the earthquake that devastated Haiti in 2010, for example. Tons of supplies were flown in and hundreds of organizations came to lend a helping hand, but they lacked an unclassified geospatial information exchange tool to coordinate relief efforts. “Operations like the response to the earthquake in Haiti revealed gaps in the methods for creating and sharing map data on critical aspects of the emergency response,” said Juan Hurtado, USSOUTHCOM’s Science Advisor.

Where are water and food distribution points? What’s the condition of roads and bridges? Where are the locations of personnel and resources deployed in support of the rescue efforts?

USSOUTHCOM’s quest for a technology solution that could answer that type of questions and close those gaps started in August 2012, when the Office of the Assistant Secretary of Defense-Rapid Fielding, funded the Rapid Open Geospatial User-driven Enterprise (ROGUE) Joint Capability Technology Demonstration (JCTD) project to develop a geospatial information sharing capability.

GeoSHAPE, which stands for Geospatial Security Humanitarian Assistance and Partnership Engagement, was created under the ROGUE project as a combination of a web-based application that sits on a server, and a portable application called Arbiter for the collection of data and images in the field.

“With GeoSHAPE, geotagged information can be shared almost in real time when an internet or cell phone connection is readily available. Otherwise, the information is sent as soon as a connection is established,” said Donald Jones, who managed the development of ROGUE for USOUTHCOM.

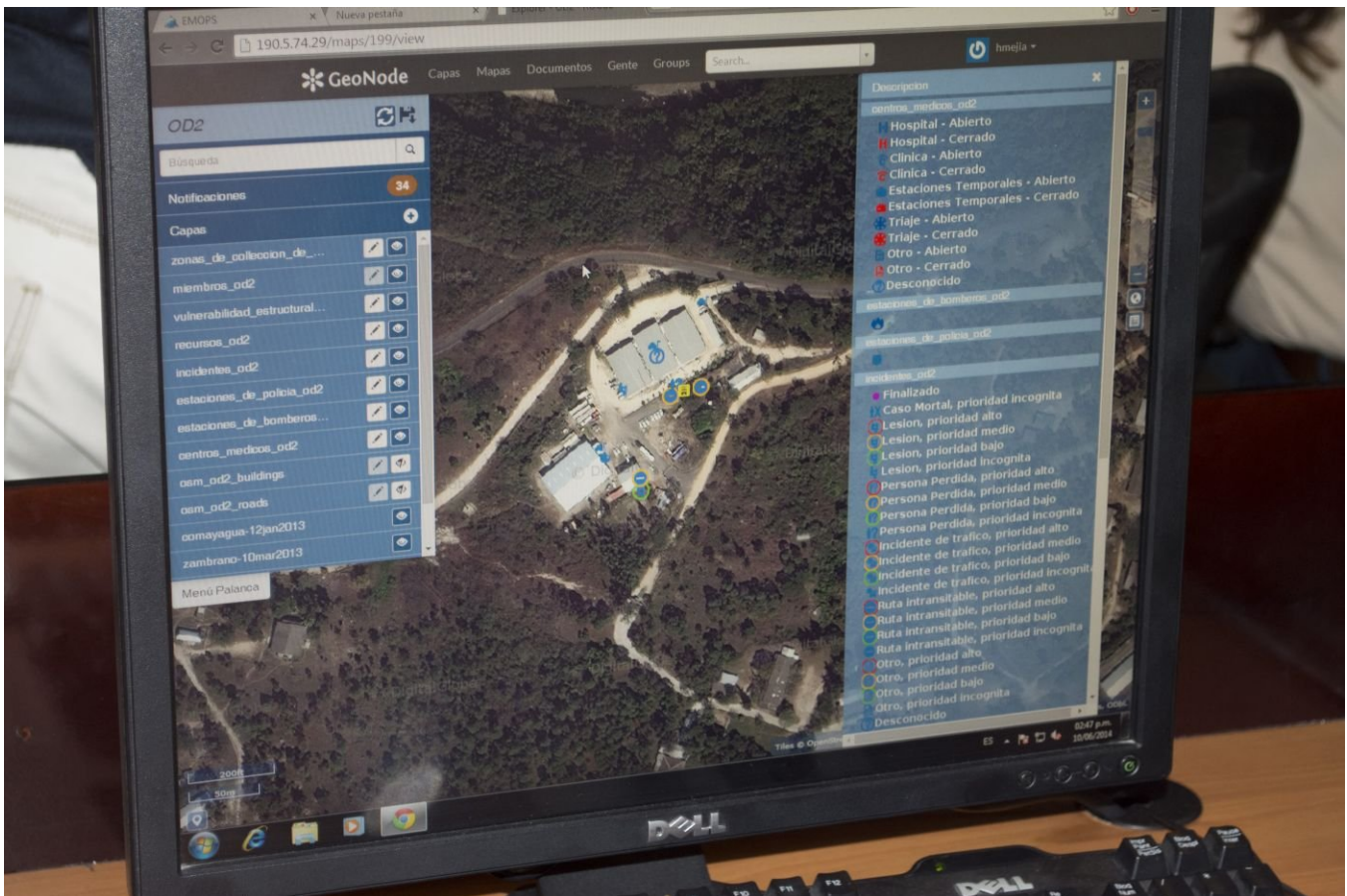
GeoSHAPE can display disaster-relevant information in a map that anybody with a web browser and the

appropriate permissions can see from anywhere in the world. “The outcome is improved situational awareness and fact-based decision making, hopefully bringing the response to people faster, more effectively,” he added.

Progress on the program moved quickly and two years after the beginning of the JCTD, the software was ready to be demonstrated in an operational setting. The location chosen: Honduras.

“Central America is often battered by hurricanes, mudslides, floodings... and our command has a long history of collaboration with Honduras in many areas”, said Hurtado, who early in his career spent a tour in the country.

The Science, Technology and Experimentation Division that he heads at USSOUTHCOM was established in 2002 and since then has endeavored to develop technology solutions to regional challenges and to provide capabilities that address U.S. military operational requirements and also build U.S. and partner nation capacity to disrupt illicit trafficking, counter transnational organized crime and provide humanitarian assistance and disaster relief.



The GeoSHAPE tool comprises a web-based platform for creating, updating and sharing geospatially-tagged events, as well as a mobile application for capturing data and photos in the field to provide situational awareness and facilitate the decision making process during an emergency response. [Photo: USSOUTHCOM's Science, Technology and Experimentation Division]

The main players in the simulated hurricane created to test GeoSHAPE were Honduras-based U.S. Joint Task Force-Bravo (JTF-B) – a task force able to dispatch airlift, logistical, medical, firefighting and other capabilities to support disaster relief missions –, and COPECO. Similar to U.S. Federal Management Agency (FEMA), COPECO is a government organization charged with providing the national response to disasters in the Central American country.

Other participants were the Honduran Red Cross and Green Cross; representatives from the Military, Police and Firefighters; non-governmental organization World Vision, and the U.S. Agency for International

Development (USAID).

Working simultaneously from their respective locations 52 miles away, JTF-B and COPECO's operators used Android tablets and cell phones to enter hurricane-related events. Symbols for helicopter landing zones, water distribution points, hospitals, blocked roads, flooded towns... started crowding the maps at both sites.

"The simulation tested how GeoSHAPE can enable organizations to collaboratively edit information from their locations and synchronize it across geographically dispersed servers to create a common picture of the disaster and the resources at hand," says Scott Clark, director of geospatial programs at LMN Solutions, a Virginia-based IT company commissioned by the U.S. Army Corps of Engineers to develop the software.

Clark also underscored the open source, open standard nature of GeoSHAPE, which makes it possible for organizations to easily adapt the software to their needs without incurring great licensing expenses.

The operational demonstration also offered the opportunity to showcase other technologies that might prove useful in the response to disasters. Among those was the CommCube, a portable Internet hotspot designed to support voice and data communications for up to 50 users in a 1,000 feet radius.

Another gadget showcased as part of the demonstration was a remote-controlled, helicopter-like aircraft that weighs approximately one pound, reaches up to 1,200 feet and can fly continuously for about 30 minutes. Known as InstantEye, the system offers birds eye views of a disaster area, without risking the lives of rescue personnel.

Other technologies demonstrated were three mobile applications that are part of the GlobalMedAid kit developed by the U.S. Army Medical Research & Materiel Command's Telemedicine & Advanced Technology Research Center. The kit includes an English to Spanish simultaneous translation application that facilitates the communication between healthcare personnel and disaster victims, a data capture solution for documenting care and treatment of the injured, and an application designed to improve training of medical personnel while deployed.

Besides the display of innovative technologies for disaster relief, Mr. Hurtado also saw this demonstration as a venue for creating and tightening links between organizations and countries. "The relationships and contacts we develop and hone through science and technology engagements create networks that will be invaluable when something happens and we actually know who to call," said Hurtado.

In late September, after the U.S. Naval Postgraduate School releases a final assessment of GeoSHAPE and its operational utility, the tool will be integrated with the Pacific Disaster Center's DisasterAWARE platform, and the U.S. Department of State Humanitarian Information Unit's CyberGIS project, an existing effort to build web mapping and geographic data sharing applications focused on complex humanitarian emergencies.

Looking further ahead, Hurtado envisions a myriad of initiatives and applications spinning off this geospatial information sharing tool, which can complement other USSOUTHCOM's efforts to improve support to the response to natural disasters and humanitarian assistance crises in the region.

