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C O M M U N I C A T I O N S

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# PUBLIC SAFETY TECHNOLOGY



Photo courtesy ESRI

## Disaster Response in the Gulf

A data interoperability project allows officials to send notes and images to the command center to aid oil spill response and cleanup efforts.

By Michelle Zilis

**A**s oil spilled into the Gulf Coast for more than two months after the Deepwater Horizon incident April 20, agencies from all levels of government from all affected states began sharing real-time information

with one another through the Department of Homeland Security's (DHS) Virtual USA (vUSA) Generation II prototype. The platform creates a user-defined operating picture based on common data, allowing partici-

pants to view information from other agencies while using their existing technologies.

"Within a few days of the actual explosion, Louisiana, Alabama and Florida quickly coordinated the sharing of each state's data in our individually operated state platforms, which was also able to be shared with the vUSA platform," says Brant Mitchell, deputy director, Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP). "We have benefited from one another, and this was all possible through the relationships that have been established through our collaboration in the vUSA pilot."

Multigovernment collaboration and teamwork are the most important take-aways from the event, Mitchell says. Leveraging funding from DHS to enhance mapping capabilities and create a new application for field users, vUSA's reach stretched even further when federal agencies and British Petroleum (BP) officials were added to the network. "The big thing is we've got the U.S. Coast Guard, the Louisiana Coast Guard and BP all able to access the network. Because they're the ones doing a large part of the cleanup, putting them all on the same page is huge," Mitchell says.

Louisiana, Alabama, Mississippi and Florida are using the Generation II prototype of the information-sharing pilot. A majority of the information shared is mapped on each state's geographic information system (GIS) platform. Louisiana and Alabama both operate Google Earth platforms (Virtual Louisiana and Virtual Alabama),



Photo courtesy DHS

Using the Alabama platform to view information from other states, a DHS exercise showed how data can be shared in real time regardless of the viewing platform.

while Florida operates an ESRI platform called State Emergency Response Team Geospatial Assessment Tool for Operations and Response (SERT GATOR).

vUSA's system-of-systems approach works with whatever existing technology and infrastructure a participant operates with, including wireless applications if available. Once information is uploaded to a state's platform, the owner of the data controls who has permission to access the information and how long it will be available. Other participants viewing the data see the information in a read-only version. The platform is limited only by an agency official's

imagination and the capabilities of the devices and infrastructure a state or agency uses, says Dr. David Boyd, director, command, control and interoperability, Science and Technology (S&T) Directorate, DHS.

Another DHS-sponsored platform, the Homeland Security Information Network (HSIN), operates as an information exchange platform for federal agencies and fusion centers. The U.S. Coast Guard publishes daily reports on the platform, which can be received by states as well as BP. During the oil spill and cleanup, HSIN was used for access to secure information, including reports, points of contact, fact sheets and other information.

## States Involved in vUSA Pilots

**Southeast Regional Operations Platform Pilot (SE ROPP):** Alabama, Florida, Louisiana, Georgia, Mississippi, Texas, Virginia, Tennessee, North Carolina and South Carolina  
**Pacific Northwest Pilot (PNW Pilot):** Alaska, Washington, Oregon, Montana and Idaho

### Data Integration

Immediately after the spill began, Louisiana staff members recognized how beneficial an application that allowed users to upload data from the field would be. Before, GOHSEP staff had to ingest field data, and one of three staff members would then upload it to the network from the office. Louisiana staff approached the DHS team about the desired applications, and DHS partnered officials with GeoCent, an IT and engineering firm. GeoCent received funding from DHS to develop an interface with the vUSA platform prior to the explosion. The company provided the dynamic data for Virtual Louisiana that is now being used across the platform at no cost to GOHSEP.

With the dynamic data interface, field staff using handheld devices connected to the Internet can upload information and receive vUSA updates. The uploaded data is then viewable to anyone granted permission. This takes out the middleman and saves time and money, in addition to supplying the most accurate data available, Mitchell says. "It's really beneficial that it's not us back in the office updating it, but rather people in the field."

### Gulf Data Layers

Field staff is focusing on three core dynamic data layers — oil sightings, affected wildlife sightings and locations of problematic booms. Booms are used to stop and contain oil while allowing water to flow. When a field worker witnesses an



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open oil or wildlife sighting, he can take a picture of an oiled animal using a Trimble Yuma device and select from a few options on a form to identify species and status of the animal to create spatial data. When the user returns to his vehicle, which is a Wi-Fi hot spot, the data is directly loaded to a geodatabase via a wireless data connection. The data is now in a spatial format, and response teams can be planned efficiently and effectively, Mitchell says. Staff observing booms for damage use similar technology.

Most of the data is entered manually as missions into WebEOC, a Web-based incident management system for emergency operation centers (EOC), and each mission is associated with a latitude and longitude. To minimize confusion, a converter converts all locations to decimal degrees. All data points are time/day stamped to give a precise historical record. The data is uploaded to Virtual Louisiana four times a day via manual pulls. Once uploaded, the information is viewable and free to all who are granted permission on vUSA, Mitchell says. "Given that these are the top issues that require rapid response, the visual that is provided when this data is put on Virtual Louisiana allows for careful planning and deployment of resources to provide the most efficient response possible," he says.

Before BP was added to vUSA, the company printed maps of oil locations and distributed the printouts. By the time the maps got into the hands of those who needed it, the information was essentially out of date, Boyd says. After BP was linked into the platform, company officials continually updated the maps when sightings occurred. Anyone in the field or in an office would be alerted of the updated maps, creating real-time situational awareness.

The incident is the largest implementation of mobile GIS technology using government, military and private sector personnel who had limited or no GIS experience, says Tom Pat-

erson, ESRI wildland fire specialist. BP purchased more than 300 Trimble Nomad and Juno PDAs and distributed them to EOCs. The transmitted field data was uploaded to the BP ArcGIS server in Houston, where it was simultaneously updated in every Internet map viewer including the Florida GATOR and vUSA.

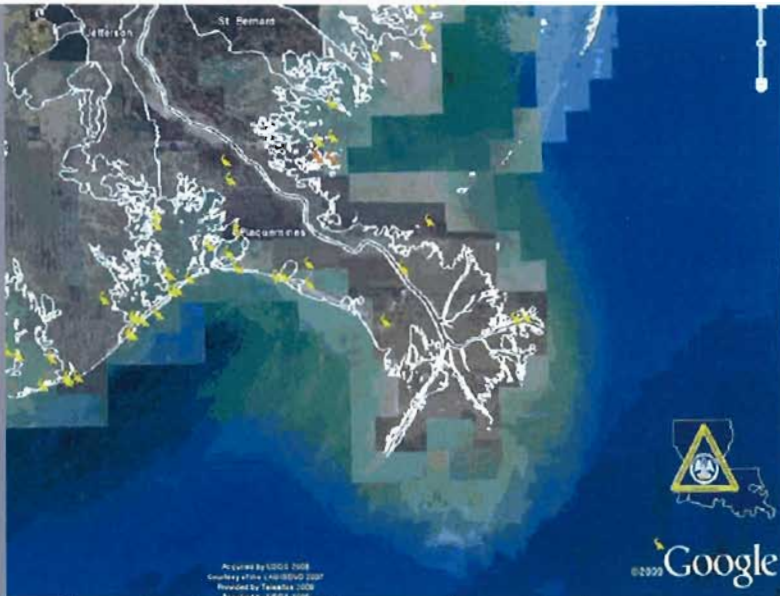
"Mobile GIS software running on handheld PDAs linked to a GIS serv-

er through the Inmarsat Broadband Global Area Network (BGAN) terminal gave us the capability to keep decision makers informed throughout the entire Gulf of Mexico region, which included five states," Patterson says. Providing the locations, digital photos and status information directly from the Louisiana marshes was used to determine "where to place containment booms to protect sensitive



## Satellite Communications Talk Groups Emergency Response

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The map shows impacted wildlife. Users can scroll over each icon to view more information.

species habitats from encroaching oil and where best to deploy rescue teams of biologists to save brown pelicans," Patterson says.

**More Applications**

Additional information shared on the network includes videos of affected areas and wetlands, status updates for cleanup activities, broken boom locations, as well as trajectories, shoreline oiling observations and current spill extents. The video provides awareness of the operational environ-

ment to give high-level decision makers a large overview, while offering the ability to zoom into areas that require closer attention. Critical habitats, such as oyster beds and bird nesting grounds, are also highlighted on vUSA, Mitchell says. Live feeds (KMZ files) that daily aggregate all incident reports related to the oil spill from state agencies enable visualization of field reports generated from WebEOCs. Information regarding poison control centers and health-related reports are shared, Boyd says.

**Websites**

- Alabama's Virtual Alabama  
[www.virtual.alabama.gov](http://www.virtual.alabama.gov)
- Florida's GATOR  
<http://map.floridadisaster.org/GATOR>
- Georgia's GO DAWGS  
[www.gema.state.ga.us](http://www.gema.state.ga.us)
- Louisiana's Virtual Louisiana  
<http://virtualla.ohsep.louisiana.gov/site>
- Virginia's VIPER  
<https://cop.vdem.virginia.gov/viper>

vUSA also helps first responders better understand radio coverage in potential operational areas through layers on the map showing signal propagation. "During the response to the oil spill, communications networks were developed and enhanced by showing the coverage from LWIN (Louisiana's Project 25 (P25) system), Texas, Mississippi and Alabama," Mitchell says. "Gaps in coverage that might impact spill response and recovery operations were easily identified and corrected through deployment of mobile communications trailers."

The platform has also factored into the planning of new tower sites. "Once gaps in coverage are identified, Virtual Louisiana can provide a quick view of critical infrastructure, population and topography that needs to be considered in the selection of new tower sites," he says.

**Generation II Prototype**

vUSA Generation II is the second prototype out of the Southeast Regional Operations Platform Pilot (SE ROPP). Generation II was scheduled to begin testing June 1, but in April, following the Deepwater Horizon incident, the four primarily affected states — Louisiana, Alabama, Mississippi and Florida — asked to use the prototype immediately. "We figured there's nothing better than a real test," Boyd says. The other six states — Mississippi, Texas, Virginia, Tennessee, North Carolina and South Carolina — involved in the

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pilot are monitoring the situation but not using the new prototype.

The key difference in Generation II is a cataloging feature. Because vUSA allows a great deal of information to be shared, it was reportedly difficult for participants to find what they needed or even know if what they needed was available. "If you're an emergency manager in one state, you don't know what or where information is," Boyd says. "It could be on 4,000 different sites, so you don't know where to look."

In response, the DHS team created an application that allows a user to search and view available data easier. "The mechanism was designed by

**vUSA also helps first responders better understand radio coverage in potential operational areas through layers on the map showing signal propagation.**

first-responder groups who decided exactly how it should look and operate," Boyd says. "Then when you go into it, you can say 'I have this information available, and I'm willing to share with whoever I pick.'"

The incident has also shed light on the importance of flexibility within the platform. Before the incident, the SE ROPP focused mainly on uses for emergency managers and hadn't considered many outside agencies. But during the relief efforts, participants recognized the potential benefits of other stakeholders.

A few private companies have also joined the platform, with Wal-Mart leading the way. Boyd says that it's helpful for emergency managers to know which stores are open and what types of supplies are available. This will be particularly helpful during

other disasters such as hurricanes that require an evacuation, he says. "You need to think of emergencies and disasters in the broadest terms possible [when operating vUSA]," Boyd says. And even then, the platform will most likely be useful for more types of disasters, as evident with the oil spill cleanup, which wasn't on the list of expected disasters for the pilot. Boyd says that's one of the best parts of

vUSA — it provides a user-defined operating picture that allows all involved to have shared real-time situational awareness. The type of disaster doesn't matter; when information is shared, everything can be streamlined and used more efficiently. ■

Michelle Zilis is assistant/Web editor for Mission Critical Communications. E-mail comments to mzilis@RRMediaGroup.com.



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