Texas Task Force 1 Enhances its Search and Rescue by Deploying with GeoSuite

The Need
Texas Task Force 1 (TX-TF1), an urban search and rescue team, needed a better way to gather and report real-time information when responding to disasters.

The Solution
TX-TF1 equips all of its first responders with nFocus GeoSuite, a web-based, advanced situational awareness and information sharing solution for first responders.

The Benefits
TX-TF1 has enjoyed a number of benefits since deployment of GeoSuite, including:

- Enhanced safety for rescuers
- Real-time visibility and updates
- Layers of information
- Ease of use
- Greater efficiency for first responders
- Robust Reporting

Everything is big in Texas—including the weather. The large landmass of the state experiences more tornados per year (averaging 139) than any other state, and it can get hammered by thunderstorms, tropical storms, and hurricanes from both the Gulf of Mexico and the eastern Pacific, all of which can trigger flash floods, wind damage, or send rivers over their banks.

When disasters strike, the Texas Task Force 1 (TX-TF1), an urban search and rescue team headquartered in College Station, Texas leaps into action as first responders. TX-TF1 has more than over 600 members—including firefighters, doctors, nurses, structural engineers, canine handlers, professors, and police officers—from more than 60 organizations throughout the state. Rescue teams can consist of water rescue squads, helicopter search and rescue squads, search and rescue overhead teams, transportation support platoons, and more.

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- Susann Brown, Search Team Manager, Texas Task Force 1

Needed: Real-Time Visibility in the Field

Communication is key to coordinating the efforts of first responders in the field—to maximize their efficiency searching for survivors, rescuing those injured or trapped, and identifying those sheltering in place and reporting their needs. Communication also is required to ensure the safety of the teams in the field. Traditionally squads in the field—whether responding to a tornado, flood, or other disaster—were tracked back at the base of operation with paper maps that were updated with notes whenever new GPS-based reports were radioed in or brought back to the base of operations on paper.

Susann Brown, Search Team Manager for Texas Task Force 1, along with her colleagues, had been looking for a technological solution for some years, trying to find a more efficient way to move beyond paper maps and notes. Ideally the solution would make it easier for first responders to report GPS data and field reports, knowing that any efficiency gains for the rescue teams would help those who depended upon their efforts.

"A number of us, for some years, were searching for a way to upgrade our paper-based system with technology," Brown says. "We looked at a lot of handheld devices and applications, but we didn't find anything that met our needs until seeing GeoSuite™ demonstrated at a conference. We all recognized its value, and saw that it could meet our needs, and be easily customized."

Finding a Complete Solution with GeoSuite

Texas Task Force 1 was impressed by nFocus GeoSuite, a web-based and mobile solution that provides real-time geospatial situational awareness and information sharing for public safety personnel, because it provides such a complete and tightly integrated solution.

"What made GeoSuite different from every other solution we had looked at is that it's so complete," Brown says. "It operates on a hand-held device that communicates with a web-based program that amalgamates the information and supports two-way communication between that handheld device and the web-based program. And there was nothing we had seen that could do this quicker, or with a better user interface."

TX-TF1 has now been using nFocus Solutions' GeoSuite since 2013. GeoSuite provides the data and communication infrastructure TX-TF1 needs to immediately report on the situation in the field—including automatic entry of GPS coordinates—and remain in real-time contact with search and rescue crews to track and coordinate rescue efforts and situational updates.

The digital management, storage, and reporting capabilities of GeoSuite is used as operations managers at the base of operations share real-time data and create reports for use internally as well as for sharing with local and state officials, agencies, and other stakeholders. The same reporting capabilities are used for post-incident reporting and analysis.
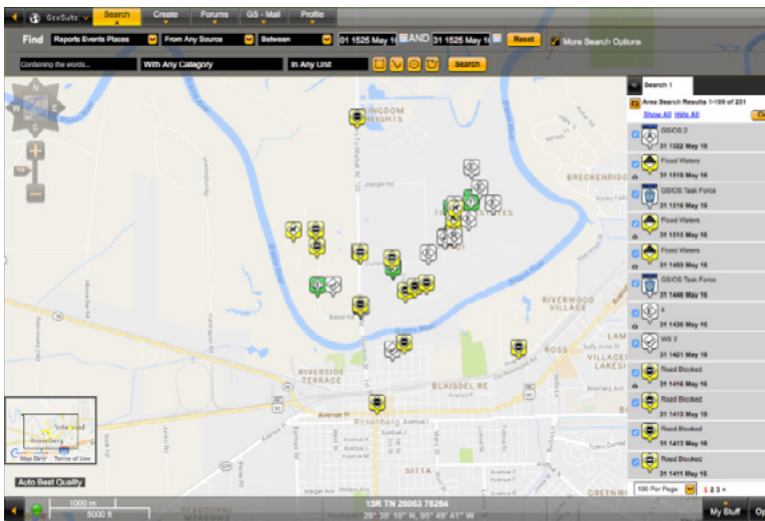
GeoSuite helps Texas Task Force 1 stay on top of its search and rescue operations.

Putting GeoSuite to Work in the Field

Once search and rescue personnel have been deployed, they locate residents who need to be rescued, assisted, or have been confirmed as sheltering-in-place. Using mobile devices loaded with GeoSuite in the field, users can place map icons to mark their rescue efforts. In addition to automatically providing the exact GPS location, rescuers can attach notes to the icon, including the number of people in each location, their needs, and any actions taken. This information can then be sent immediately to a centralized server at the base of operations, where operations managers see every placed icon and note, while using the web-based GeoSuite application.

Table of Contents

"What made GeoSuite different from every other solution we had looked at is that it's so complete."

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Shelter-in-place icons are used when rescue squads perform welfare checks on those stranded. These icons are color-coded by severity of the situation and keep information about the indwellers organized and easily accessible so those at the base of operations and those in the field can monitor their individual situations.

- **A green shelter-in-place icon** is placed when people have stayed behind but are safe and on dry land. They may be without power and unable to leave the area because of a flooded roadway, but they are not in need of further assistance at the time the icon is placed.

- **A yellow shelter-in-place icon** is positioned on the map when the residents who are sheltering are currently safe but will need assistance in the near future. For example, their food and water may run out in the next few days or they may need a new supply of medication. A yellow icon also means if the current situation changes and more flooding occurs, TX-TF1 will have to deploy a team to help evacuate in that location. Photos can be added to the icons to enhance the information and give a better understanding of the situation at hand.

- **A red shelter-in-place icon** means the residents who are sheltering are in a very dangerous situation, but they refuse to leave. For example, an individual may need supplemental oxygen to survive, but if they later lose power to their home, their oxygen tank may not function. With this icon on the screen, the managers know that something else needs to be done or they need to get law enforcement involved because they are the only ones who can force the residents to evacuate. TX-TF1 can offer a ride out of the situation, but they are not permitted to force anyone to leave. A red icon alerts everyone that immediate action is needed and the resident may be in a life or death situation.

After responding to a call or performing a welfare check, the squads are able to change the icon on the map to show the check has been completed and to attach notes on what action was performed, if any. The ability to send the information to the operations managers in real-time keeps the rate of redundancy of checks down, and it allows the operations managers to get the information to the necessary parties quickly and accurately.

In addition to rescuing residents in emergency situations, TX-TF1 also provides assistance to pets and livestock left behind or lost in the event of a weather emergency. TX-TF1 rescues and evacuates many animals during a deployment. The search and rescue squads mark areas on the map where animals were rescued or still need help, which allows for quick response times and many saved lives.

"Back at the base of operations, the GeoSuite icons let us see exactly where and when events are taking place," says Katie Breland, Planning Team and Training Manager at Texas A&M Engineering Extension Service and Texas Task Force 1. "And GeoSuite helps our teams to move faster because with our old system they had to enter GPS coordinates by hand for each person sheltering in place at a given location. With GeoSuite the GPS entry is automatic. This makes a big difference because in some locations there might be more than a dozen people gathered in one place."

When disaster strikes, Texas Task Force 1 responds.

Enhanced Safety for Rescuers

Texas Task Force 1 also uses GeoSuite to keep team members safe with its Personnel Accountability Reports (PARs), an important part of ensuring the safety of each team member in the field. Team leaders drop a PARs icon on the map to let operations managers know where a team is at any given time during a deployment. Teams are given certain amounts of time between each PARs check-in. If a team does not place a PARs icon on the map, the operations managers will make contact to determine if another unit needs to be dispatched to verify the location and condition of the team.

"GeoSuite gives us Flash Messaging capability. … I can just circle a group of our rescuers in the field and send them a warning to take shelter because dangerous conditions are heading their way."

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A PARs icon tells the base of operations team what the group is doing, where they are, and that they are safe. The web-based system allows all participating search and rescue teams and operations managers to be kept up-to-date on the teams' locations and their own welfare, while also giving them the ability to collaborate using the same operating picture view with information from multiple sources.

In between PARs reporting, the real-time updates of GeoSuite help operations managers know that their teams are safe.

"As someone who is putting people in the field and has a responsibility for their safety, I value the fact that with GeoSuite we see every time they are putting an icon as to where they're searching," Brown says. "Whether it's a damage icon or a shelter-in-place icon, or any other update, we can see they are working away and that they are ok. If their icon placements stop, then we can make contact to make sure that everyone is safe and take action if help is needed."

Breland likes the fact that communication with GeoSuite goes both ways, especially because in the case of floods and storms, rescue crews may be deployed while the event is still under way.

"GeoSuite gives us a Flash Messaging capability," Breland says. "We often have a better weather picture at the base of operations than they have in the field, so if we see a thunderstorm or tornado approaching,

Texas Task Force 1 operations managers use GeoSuite PARs tracking to ensure rescue teams are safe. .

Rescue teams can attach photos to GeoSuite icons to provide a sense of the destruction they find in the field.

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Breland likes the fact that recipients of the Flash Warning must acknowledge it before using their phone for any other purpose. "It's far easier for us to track weather conditions back at our base with our large screens and incoming weather reports," Breland says. "Out in the field, our people can sometimes get so focused on searching for and rescuing people, they might not be keeping an eye on the sky."

Real-Time Visibility and Updates

The term fog of war, meaning the uncertainty of what might be happening on a distant battlefield, applies to disaster efforts as well. That's why Texas Task Force 1 values the real-time visibility that GeoSuite provides. "We used to be reliant just on radio contact with our crews in the field, their paper-based activity logs, and our paper maps at our base of operation," Breland says. "With GeoSuite we can look at our screens and see exactly where our squads are in the field, and monitor their progress in real-time as they put down icons on every house they've checked, and mark where people are sheltering in place. They can also drop a damage icon or a flood icon, with a time-stamped photo or video attached. This gives us great visibility into the situation and to how it is changing."

Breland also likes the ability to zoom in or out, going from the efforts of a single rescue squad, to an overview of the entire geography of concern. "We've had situations where we've had teams deployed across an area of hundreds of square miles. With GeoSuite we can see exactly where we have teams deployed, and also see areas we may still need to cover." The flood icons, with attached photos and field reports, help rescuers in the field, as well as operations managers back at the base of operations, see what water levels are doing over a period of time. "It's very helpful to know if the water is rising two feet in an hour," Breland says. "And we can also see when rescuers have changed a shelter in place icon from green (safe) to yellow or red; and monitor as they take action. The visibility we get from GeoSuite allows us to make faster and better decisions to support our people in the field."

Brown agrees about the power of visibility.

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"In the past, sometimes the problem was having too much information, meaning that you need to be able to filter through to identify the most urgent issues," Brown says. "With GeoSuite everyone sees the same picture. The last thing you want is for an urgent issue to get lost, and with GeoSuite, everyone can see where we have yellow or red issues requiring attention."

The operations managers also see when a yellow or red icon is updated, and can click to see the report on how the situation was resolved.
Brown says the ability to scroll in and out also helps the teams in the field. They can scroll beyond their own sector of activity to see what is happening elsewhere in the disaster area, getting a more complete picture from the icons and reports posted by others.

"The web-based application helps everyone involved see what is happening," Brown says. "We are always working with other jurisdictions, so towns, counties, and the State Operations Center can all see the exact same information we are dealing with. This really tightens the communications loop."

Layers of Information

Texas Task Force 1 values the seamless way in which GeoSuite allows users to navigate up and down through layers of information.

"We can go down into deeper layers so the field team can see details of the area in which they are immediately working," Brown says. "And we can pull back for overview layers that show the bigger picture to answer questions such as how many buildings are damaged . . . how many people have been evacuated . . . how many people are sheltering in place . . . what infrastructure has been damaged . . . and just about any other situational question we might need answered.

"These are the kinds of questions we're asked when working with different jurisdictions and local or state officials," Brown continues. "We're often the first eyes in the area so we are often asked to determine how badly damaged an area is. We can look at the damage icons our teams are putting in place, read their assessment notes, and view photos or videos they've attached, and provide real-time information and updates. We now have capabilities we just didn't have in the world of paper."

Search and rescue teams use GeoSuite to provide real-time updates on their efforts.

Easy to Use

Task Force 1 found out that GeoSuite was easy to use—even sooner than they wanted to. The group was still testing GeoSuite when a tornado struck Moore, Oklahoma. The group was already sold on the capabilities of the web-based application, but hadn't introduced the handheld version to their first responders.

"We got the call for a tornado deployment, borrowed some smartphones, loaded the GeoSuite app, and handed the phones out to our rescue crews," Brown recalls. "We only had time for a quick 5-minute introduction. We just said: 'Open the app, touch the screen when you want to enter information, and use the icons whenever you want to report a rescue, or damage, or anything else.' They were very surprised at how easy it was to use. They like GeoSuite a lot.'"

Brown could see that the search and rescue crews immediately learned the app as back at the base of operations they watched on their large monitors as the crews methodically placed icons and filed reports as they performed their duties in the field.

Breland says the rescuers especially liked having a digital keyboard to work with. "Previously they entered information using GPS devices in which they had to toggle through multi-function keys to select each letter as they entered information," Breland says. "So a lot of the information ended up as notes on paper that rescuers had to report back via radio and then later type out for reports. With GeoSuite they saved a lot of time and frustration by simply typing the information in without having to deal with toggle keys, and without having to pull out pen and paper."

Greater Efficiency for Responders in the Field

That first Tornado deployment also demonstrated that GeoSuite enhanced the efficiency of search and rescue squads in the field. Not only was information easier to enter but it became immediately available back at the base of operations. This slashed the time required for hourly check-ins, and greatly reduced radio traffic—a major benefit for disaster operations communication, especially when there may be dozens of teams in the field competing for radio time.

"We have equipment to deploy mobile hotspots if the cellular networks are down, but if our teams are out of range, our rescuers can continue to use GeoSuite. … GeoSuite will still store everything that they are entering."

- Katie Breland, Training Manager, Texas Task Force 1

After deploying search and rescue teams into the field, operations managers back at the base of operations, working with early reports, estimates completion time for the current operation to help in orchestrating when, and to where, the team can be sent next.

"I've done a lot of tornado deployments and have a good sense for how long rescue teams will need to complete their objectives," Brown says. "For the tornado with which we first used GeoSuite I had determined that it would take approximately two full days to finish our search objective. Several hours into the search, we were way ahead of schedule. In fact, to the point where we could see we would complete our objectives in just one day. A major reason for this was because the field teams were able to enter their information via GeoSuite.

"We were searching homes, and with GeoSuite we realized that our teams were spending very little time having to stop, meet physically, and count by the paper method we previously used to figure out exactly the ground they had covered and, which houses had been searched," Brown continues. "Typically we had these meetings in the field once every hour. But with GeoSuite we were collecting the data in real-time."

The old way of relaying data via collecting papers and transmitting reports across the radio could be time consuming.

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"Our hourly data exchanges could last from 5 to 15 minutes," Brown says. "If you lose 15 minutes in an hour, that's a 25% hit against what could be your search time," Brown says. "So the efficiency of our rescue teams in the field has increased dramatically."

Efficiency is also boosted as rescuers reporting an event no longer have to enter the GPS coordinates by hand. And in cases where the disaster event has wiped out local cellular coverage, rescuers can continue to use GeoSuite to collect information, which is then transmitted upon reaching a cellular network.

"We have equipment to deploy mobile hotspots," Breland says. "But if our teams are out of range, our rescuers can continue to use GeoSuite. As long as they have cached their maps from the base of operations before they go out in the field to the area they're going to be working, the phone will hold the maps, and the GeoSuite will still store everything that they're entering."

Robust Reporting

Search and rescue operations and planning personnel at the Task Force 1 base of operations appreciate the ease with which they can create their daily reports and other documentation using the reporting capabilities built into GeoSuite.

Each evening during a deployment, operations managers create reports on what was accomplished that day. In the past, pulling reports for the end of the day and the end of the deployment was time-consuming and difficult. Managers would have to sort through each radio log and daily activity log (referred to as a Form 214) to gather the information and add up the numbers by hand. They would often be in their offices pulling reports and adding numbers until the early morning hours, and, frequently, the numbers wouldn't match what was originally reported. With the implementation of GeoSuite, however, operations managers

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can now seamlessly export data to a spreadsheet that is automatically populated with numbers reported by search and rescue personnel in the field, making compiling and reporting rescue data faster and more accurate. The real-time information transfer helps the operations managers work efficiently, and they are able to fix data quality issues as they arrive.

Reporting is also made easier because GeoSuite gives team members in the field the ability to write a description of the situation—including the number of people rescued, assisted, or sheltering—in the title of the icon, making it easy for the operations managers to glance at the map, and see the numbers. If an icon title does not have the number displayed, the manager can simply click on the icon and write the details down immediately instead of having to wait until the end of the day to go through each hand-written or transcribed log.

This ability to keep all of the records up to date in real time leads to more reliable data, quicker exchanges of information, and more certainty when it comes to making decisions on whether more search and rescue assets are needed or a disaster declaration needs to be made.

"Reporting is so much easier with GeoSuite," Breland says. "For example, I can choose which types of icons I want to run a report on, which for a flood event will be icons for people rescued, people evacuated, people assisted, and all the different shelters-in-place. From there I can just move it into Excel, and do data sorts and whatever formatting I want. This is so much faster than going through our paper-based 214s and counting events that way."

GeoSuite also integrates with Microsoft Word and PowerPoint, making it easy to create text-based reports that can include photos posted to GeoSuite from the field. The reporting helps disseminate information beyond the operations center.

"As our people in the field are putting down geolocation icons, people in the governor's office are seeing it all in real time from their own GeoSuite applications," Breland says. "The reports we create, or the reports they create on their own, lets the governor and other stakeholders know how many people have been impacted, how high the water is, how many houses and other structures have been destroyed—which gives them

a head start on preparing a disaster declaration. It also helps them see where resources need to be deployed as well as foreshadowing the need for a Disaster Summary Outline."

As Texas Task Force 1 completes its work, GeoSuite reporting makes it easier to pass the baton to those who follow. "Task Force 1 is there to protect life and safety," Breland says. "Once the life and safety situation has been handled, we're out of the field. GeoSuite makes it easier for us to generate the reports needed to pass on the information to whoever's coming behind us so they have a better idea of what they're going to be getting into."

About Texas Task Force 1

Texas Task Force 1 functions as one of the 28 federal teams under the FEMA Urban Search and Rescue System and as a statewide urban search and rescue team under direction of the Texas Division of Emergency Management. To find out more about Texas Task Force 1, visit: www.texastaskforce1.org

About nFocus

nFocus Solutions is dedicated to the development of innovative technologies and intelligent business solutions for the public sector. We are the leading provider of applications that communities, nonprofits and government agencies rely on to make their organizations more effective. Our high-quality data management and analysis software enables our clients to achieve clear, well-defined results that change the world.

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