

# PATHFINDER



HUMANITARIAN ASSISTANCE  
& HOMELAND SECURITY



## On My Mind: GEOINT Supports Community and National Resilience

In the past two years, NGA has responded to a series of natural disasters at home and abroad. Whether providing support to emergency response teams working the aftermath of the earthquake in Haiti, the tsunami in Japan or tornadoes and floods in the United States, NGA employees worldwide have demonstrated the critical role of geospatial intelligence (GEOINT) in answering the call for help.

Our humanitarian assistance/disaster response work, among all the roles and responsibilities that come with managing the nation's GEOINT capabilities, brings us closest to the people and communities in need during times of crisis. Our GEOINT tools and analyses save lives by helping our mission partners determine where help is needed most, by enabling the right people to be at the right place at the right time, and by anticipating what might happen next.

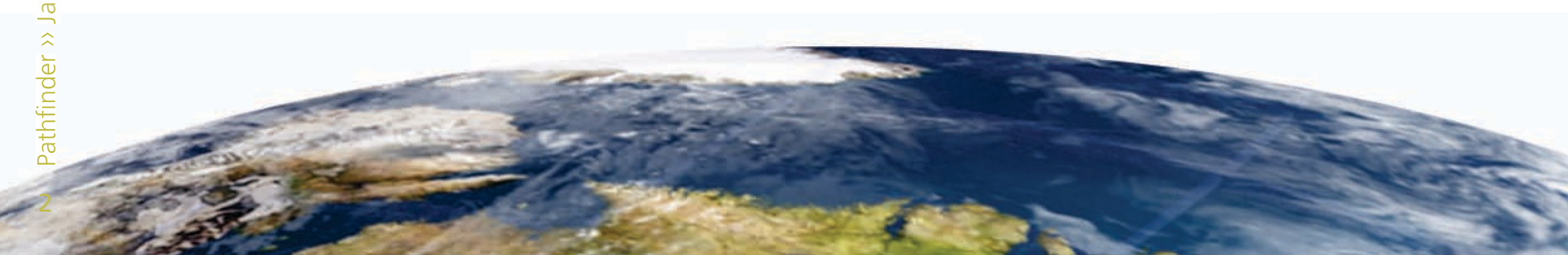
In partnership with our key stakeholders at the Department of Homeland Security and the Department of State, our goal is to help domestic and international communities become stronger, more resilient and better prepared for the future. NGA's Disaster Support Initiative, supported by NGA's GEOINT Visualization Services, gets us to this goal. Recognizing that our partners are becoming more proficient users of GEOINT, the architecture driving our applications allows individuals closest to the scene to integrate information from multiple sources in real time.

The stories shared in this issue highlight some of the Disaster Support Initiative's key accomplishments. They show how our new content and applications, in concert with mobile commercial-off-the-shelf technology, empower first responders by making GEOINT discoverable and usable in an unclassified operating environment.

These accomplishments provide a foundation for the Disaster Support Initiative to address a more robust set of challenges. With a better understanding of our mission partners' operating environments and their relationships with state and local communities, foreign governments and multilateral organizations, we can now form a holistic view of domestic and international networks and systems for emergency preparedness and response. In the near future, NGA will stand up an Integrated Work Group (IWG) for disaster support, to focus the expertise of a number of disciplines to develop new tools, analytic methods and work processes to address preparedness and response challenges, taking both man-made and natural disasters into account. Through the IWG, NGA will broaden and deepen analysis for early warning and fine-tune its engagement with partners responding to long-term and complex humanitarian crises.

The strength of our GEOINT vision is clearly visible in our work with first responders and disaster relief professionals at home and abroad. I am proud of how much we've already accomplished in this critical arena. By putting the power of GEOINT into the hands of local, national and international civil authorities and emergency response teams, we are helping them save lives as well as rebuild stronger and more resilient communities. This is a strong affirmation of the importance of our work and the necessity of our vision.

Letitia A. Long  
Director



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**On the Cover**

U.S. Navy Lt. Cmdr. Timothy Mickel examines a patient at the Killick Haitian Coast Guard Base surgical screening site during Continuing Promise 2011 in Port-au-Prince, Haiti, Aug. 18, 2011. Continuing Promise is a five-month humanitarian assistance mission to the Caribbean, Central and South America. U.S. Navy photo by Petty Officer 2nd Class Eric C. Tretter. Cover design by Amy Battison.

**On the Back Cover**

NGA celebrates the birthday of Dr. Martin Luther King Jr. on Jan. 16, 2012. The Washington, D.C., Martin Luther King Jr. National Memorial, dedicated on Oct. 16, 2011, commemorates King's life and work and honors his national and international contributions to world peace through non-violent social change. NGA photo by Rob Cox.

## NGA Director Highlights Vision at GEOINT Symposium

By Karen Finn and Rosemary Heiss, Office of Corporate Communications

NGA Director Letitia A. Long addressed the agency's progress toward its vision Oct. 17 with more than 4,000 attendees at the U.S. Geospatial Intelligence Foundation Geospatial Intelligence (GEOINT) Symposium at the Henry B. Gonzales Convention Center in San Antonio.

"We've spent the past year laying the foundation to make this vision a reality, and we've made significant progress on a number of fronts," said Long in her keynote address.

Long outlined her framework for progress, highlighting four interconnected elements: content, open information technology, customer service and analytic depth.

The highlight of her presentation was the live demonstration of several applications recently used by federal agencies.

With an electronic tablet in hand, Long demonstrated apps the agency has developed including the Disaster Atlas, which provides a suite of applications designed to support first responders, allowing them to swap hard copy atlases for online versions. This improvement allows NGA to produce more than 6,000 pages per hour compared to the previous 200 per hour. The additional benefits include providing instantaneous, refreshed data throughout recovery efforts and eliminating costs required for mass printing and distribution.

The director also demonstrated the Aeronautical Kneepad app, a collection of airport and flight chart data that allows pilots to replace pounds of hard-copy references with digital format, enabling instant updates rather than the static, 28-day use of the current product. This app began beta testing with the U.S. Air Force Air Mobility Command Oct. 17, Long said.

"I'm sure we cannot imagine today the apps we will need tomorrow," said Long. "We are going to continue on this path. There is irreversible momentum in our effort to provide the Intelligence Community with constantly improving integrated intelligence."

The GEOINT Symposium, annually one of the largest gatherings of intelligence professionals in the world, also provided the platform for other Intelligence Community (IC) leaders to discuss their priorities.

Director of National Intelligence James R. Clapper Jr. announced that the Quad—a Defense Intelligence Agency, National Security Agency (NSA), National Reconnaissance Office and NGA



NGA photo by Rob Cox

National Geospatial-Intelligence Agency Director Letitia A. Long demonstrates live an application NGA developed for first responders during her keynote speech at the GEOINT Symposium. The demonstration was part of her update on progress the agency has made toward achieving the vision of putting GEOINT in the hands of the users.

collaborative effort to unify defense intelligence infrastructure and information sharing initiatives—has become the Quint. CIA, the only non-defense major intelligence agency, was not originally part of the effort but has now joined.

The collaborative information technology environment will help the IC find significant savings as agency budgets shrink due to federal budget pressures, said Clapper.

During the symposium, chief information officers from the IC agencies discussed the central role of cloud computing in the IC's future.

Cloud architecture will improve security, lower costs and boost performance, said NSA Director Gen. Keith R. Alexander, who also serves as commander of U.S. Cyber Command and chief of the Central Security Service.

Operationally, the cloud will provide analysts' easier access to information, said Alexander.

During a press conference, Long told reporters that NGA is already working with NSA on cloud computing. NGA has unclassified data in NSA clouds now, she said. "We are going in that direction." 🌟

## NGA IN THE NEWS

### Cumming Named DOD Outstanding Employee With a Disability

By Susan H. Meisner, Office of Corporate Communications



Deputy Assistant Secretary of Defense for Wounded Warrior Care and Transition Policy John R. Campbell honored National Geospatial-Intelligence Agency's Sean Cumming with a Secretary of Defense award for his outstanding contributions to national security at the 31st annual Department of Defense Disability Awards Ceremony and 24th annual DOD Disability Forum Dec. 6 at the Hyatt Regency Hotel, Bethesda, Md.

The award recognized Cumming as a highly motivated and exceptional branch chief dedicated to the success of his employees. Currently the chief, Northern Africa Branch, Office of Eurasia and Africa, Directorate of Analysis and Production, Cumming also served with the Office of Time Dominant Operations—NGA's "watch" center.

While honored to be recognized, Cumming appreciates the opportunity it provides. "The award provides a platform to champion the efforts of individuals who've overcome challenges—both those they were born with or incurred in Afghanistan or Iraq," said Cumming.

Cumming was originally recruited to government service as a student intern through a program to increase the number of minorities and disabled persons in the workplace. Born with a rare birth defect (proximal femoral focal deficiency), he is an above-the-knee amputee. He credits Shriners Hospital for Children with the successful surgeries that allow a prosthetic right limb to give him mobility.

Cumming has a master of science in strategic intelligence from the Joint Military Intelligence College and a bachelor of arts in history and political science from the University of California, San Diego. He is married and has two young sons and was one of 20 award recipients from across DOD agencies.

### ArcGIS Software Provides Faster Speed, Smaller Footprint

By Susan Marchant, NGA CJMTK Program Manager

The NGA Commercial Joint Mapping Toolkit (CJMTK) program office hosted a two-day workshop in McLean, Va., in September to preview a new, prototype ArcGIS Runtime software. More than 50 developers representing 20 CJMTK programs attended. Runtime software requires a fraction of the disk and memory space of applications built with older ArcGIS technologies while demonstrating increased speed.

The CJMTK program, an NGA partnership with Northrop Grumman and Environmental Systems Research Institute (Esri), has been helping Department of Defense mission application developers build, test and field geospatially enabled software for warfighters for almost a decade. ArcGIS Runtime represents the evolution of the commercial off-the-shelf model that underlies the CJMTK. Developers can use Runtime to adapt ArcGIS software to their user platform, from Windows to Linux to mobile devices such as smartphones and tablets.

ArcGIS is Esri software that enables discovery, access, visualization and dissemination of geospatial information. CJMTK is a collection of software components that command, control and intelligence developers embed into their mission applications to support the use of standardized geospatial visualization and analysis tools tailored to their specific missions. For more information go to [www.CJMTK.com](http://www.CJMTK.com).

### NGA Alumni Visit NGA Campus East

By Laura L. Lundin, Office of Corporate Communications

Members of the National Geospatial-Intelligence Alumni Association (NGAA) viewed a scale model of NCE during a tour of the facility Dec. 1.

More than 15 members, all former employees of the agency, attended the event, which toured key areas such as the NGA Operations Center, the NCE Conference Center, the National Geospatial-Intelligence College and the NGA Hall of Fame. The tour also showcased NCE's "green" design elements and collaborative work environment.

"It is a beautiful building," said Kathleen Smith, who was inducted into NGA's Hall of Fame Sept. 27 for her contributions to the geospatial intelligence mission and workforce. "I can definitely see how it would facilitate communication within the agency."

In June 2011, NGA's alumni groups—the Aerospace Charting Seniors, in the West, and the NGAA, in the East—adopted a constitution that officially merged the two into NGAA and created East and West chapters.

"I appreciate your continuing commitment to the many disciplines that make up geospatial intelligence," NGA Director Letitia A. Long wrote in a letter Nov. 30 formally recognizing the merger. "And I am confident that the positive relationship among our NGA communities—East and West, past and present—will continue to grow in the years ahead."



NGAA members view a scale model of NCE during a tour of the facility Dec. 1.

## NGA and First Responders Field Test Mobile Apps

By Kathi Ghannam, Contractor, Office of Corporate Communications

Hurricane season is typically busy for the National Geospatial-Intelligence Agency's (NGA's) Office of the Americas North America and Homeland Security Division (PMH), and this past year was no exception. Analysts deployed to support Hurricane Irene planning and relief efforts in Massachusetts, Virginia, Pennsylvania and New York, while others were on standby to support Tropical Storms Lee, Maria and Nate.

"Key to successful disaster support operations is careful advanced planning and building of strong relationships with agencies like the Federal Emergency Management Agency (FEMA)," said Stephen Jackson, NGA's Homeland Security Division Chief. "NGA can't fulfill its domestic support mission without an official request from a lead federal agency like FEMA, so it's important for them to know our capabilities and for us to understand their needs."

"Depending on storm track and strength and tidal considerations, FEMA regions will send NGA a mission assignment request for geospatial intelligence support," said Jackson. "Ideally, we receive requests for support three to five days before a hurricane hits so that we can be on scene providing baseline data."

On the heels of an eventful summer, during which PMH simultaneously supported flooding in the Midwest, fires on the East Coast and tornadoes in Joplin, Mo., and Tuscaloosa, Ala., analysts once again assembled their fly-away kits, complete with laptops, printers and plotters. This time they had a new tool at their disposal: the mobile application.

During the Hurricane Irene response efforts, NGA analysts working as part of the Disaster Support Initiative (DSI) working group (one of eight working to fulfill the vision of putting the power of GEOINT in the hands of users) developed and tested two mobile applications. The disaster atlas app enabled urban search and rescue (US&R) users to manage and share information in a dynamic and visual geospatial context. The Homeland Security Infrastructure Program (HSIP) compass app (which provides situational awareness by incorporating user-defined infrastructure data) provided a GPS-compatible compass and proximity indicator with an electrical grid overlay.

Use of the apps is changing the face of disaster support, said Jackson, who was also NGA's Hurricane Irene Focus Cell Lead. "The results of our field testing were outstanding," he added. "The apps were well received by the customer."

"This is fantastic," said the head of Fairfax County Search and Rescue about the apps. "It's where we need to be."

Instead of creating hard-copy map volumes, comprised of over 2,000 individual map sheets covering broad geographic areas, first responders used the apps to quickly discover data on the exact locations of concern online, including information on vulnerable population centers.

This capability is a great example of the NGA vision in action, said Jackson. "We are realizing efficiencies while bringing new capabilities to the mission right now by tweaking existing capabilities and leveraging the expertise of NGA's Enterprise Operations (information technology), InnoVision (research and development) and Acquisition Directorates. We are able to turn out new value-added capabilities in days or weeks instead of months or years."

Using these apps, NGA's analysts were able to show the search and rescue teams how to customize geospatial products specifically for the area in which they were operating. This worked even when the area was as widespread as Hurricane Irene's, which affected areas from North Carolina to Maine.

Deployed to the field with the US&R teams, analysts Rich Benjamin and Nat Wolpert demonstrated how their handheld devices could create the equivalent of 6,000 electronic map sheets per hour, saving untold staff hours and reams of paper typically exhausted in preparing hard-copy map books for FEMA, thus allowing analysts to do deeper and broader analytic work.

During Hurricane Irene, analysts were able to provide additional layers of the HSIP data to include farm locations, which helped predict and thereby mitigate agricultural run-off to local water supplies. "Using the apps freed us up to begin reviewing GPS logs from first responders, and therefore we were able (to) turn around search progression products by morning," said Benjamin.

US&R teams and other first responders continue to field test the two apps as well as three other developmental apps—the social media, golden hour (3-D population weighted damage assessment) and US&R field event entry apps. As a result of these field tests, DSI staff is improving the golden hour app by adding U.S. Geological Survey real-time earthquake updates (pager and shake map services) fed directly to the user's handheld display.

NGA Director Letitia A. Long demonstrated these apps during her keynote address at the GEOINT Symposium in San Antonio Oct. 16-19. More than 4,000 government, international and industry professionals had an opportunity to have a first-hand look at the new capabilities and talk with the experts at NGA's booth.

Members of the DSI team also briefed FEMA Administrator W. Craig Fugate on the five applications prior to their formal unveiling at GEOINT. "We need to get the data to the end users fast enough to affect outcomes," said Fugate, acknowledging the apps' ability to deliver. He also discussed expanding

the use of the apps outside of the US&R mission to include post-event assessments by FEMA ground personnel and special security events involving the Secret Service.

"NGA's DSI is actively seeking principal initiative partners and is employing a spiral development methodology to deliver new capability to its mission partners on a quarterly basis," said Jackson. By serving as a strategic catalyst to evolve NGA's business processes and create a dynamic cultural change centered around empowering the end user, the DSI plans delivery of three spirals worth of apps and services based on user needs before the June 2012 timeframe. These apps are expected to be self-, assisted- and full-service compatible and capable of supporting worldwide disaster recovery and special security event training, planning and operations.

The DSI is continuing to offer its solution to a wider audience, to include combatant commands, Department of State, National Guard Bureau and other first responder organizations to aid in providing increased mission and humanitarian assistance capability. ✨



NGA photo by Tony Boone

NGA's Analysis and Production Directorate Office of the Americas created the Disaster Atlas application. The app helps first responders quickly gain situational awareness after a disaster. Urban Search and Rescue Teams (USRs) used the app extensively during Hurricane Irene; it can produce 300,000 electronic map pages per hour, compared to the 200 pages per hour produced manually. The app can pull in a host of data from the Homeland Security Infrastructure Program used by USRs and is compatible with iPads, iPhones and droid phones on 3 and 4G networks.

# NGA Domestic Deployment Team Responds to Heartland Flooding

By Karen Walker, Contractor, Office of Corporate Communications

Answering the call for emergency response to the 2011 Missouri River flood, National Geospatial-Intelligence Agency (NGA) domestic deployment team members lent their geospatial intelligence (GEOINT) expertise to the Federal Emergency Management Administration (FEMA) and the U.S. Army Corps of Engineers (USACE). Team members deployed to regional coordination and operations/command centers in Missouri, Nebraska and Iowa for periods of two to four weeks in June and July to help relief workers prioritize assistance to the most vulnerable among the displaced and to inform floodwater control and mitigation decisions.

## Saving Lives and Property

Last year's unusually heavy Rocky Mountain snowpack and unrelenting spring rains forced the Missouri River to crest its banks at historic levels. The flood, which the St. Louis Beacon's Robert Koenig called a "slow-moving tsunami," demanded a high degree of situational awareness for federal, state and local officials to simultaneously render aid, issue warnings and prepare down-stream communities.

Extracting data from commercial satellite imagery and radar, NGA analysts produced flooding extent shape files that interagency and state and local partners adopted as the definitive common operating picture for coordinating resources. When NGA could not meet requests for information with commercial imagery, FEMA tasked the Civil Air Patrol (CAP) with collecting time-sensitive, high-resolution aerial photography. Bruce Heinlein, Chief of NGA's Strategic Command NGA Support Team, served as one of those CAP pilots in FEMA's Region VII, offering firsthand knowledge of the region. David Pinter, an analyst with the Analysis and Production Directorate's Office of the Americas, joined two of the flights, navigating toward priority locales such as suspected levee breaches, impassable highways and endangered critical infrastructure.

Working around the clock to extract and format data, NGA's analysts generated atlases and other high-fidelity visual analysis products that integrated multiple types and sources of information for tactical response. Customized

products included an analysis of U.S. census data to guide distribution of mass care supplies; an easy-to-read road closure map consolidating information for Montana, Nebraska, Missouri and Iowa planning agencies; and maps that tracked flood waters' progress toward critical infrastructure. In addition to delivering customized products, NGA's analysts took the opportunity to share their knowledge and skills, training FEMA staff unfamiliar with visualization tools to use ArcGIS and Google Earth®.

## Improving Accuracy of Dynamic Flood Models

During the 2011 Missouri River response NGA analysts for the first time served side-by-side with the Corps of Engineers. "It was a very smart move because we had immediate intel on the status of levees, releases from dams, hydrology information, sand boils and other indicators and warnings," said Sue Morse, a geospatial analyst with NGA's North America and Homeland Security Division, Domestic Response Branch-West. Noting that "analysts are never deployed alone," Morse involved NGA imagery scientists in the effort to detect sand boils in the flooding and along the levee toes.

The Engineers relied on their own dynamic models to predict water flows throughout the Missouri River Basin. These models rested on the Corps' institutional knowledge of permanent dams and levees, as well as emergency enhancements, to understand the systemic impacts of rainfall, planned releases, overflows and breaches. NGA's embedded analysts provided real-time imagery analysis to continually recalibrate the models with facts on the ground, increasing the accuracy of flood predictions.

According to NGA's Stephen Jackson, Chief of the North America and Homeland Security Division, a before-and-after assessment of the flood's impact on Louisiana established the flood extent model's accuracy as greater than 90 percent. Flood waters surrounding Nebraska's Fort Calhoun and Cooper Nuclear Power Stations added to public concerns and the complexity of the Army Corps' task. With the lessons of Fukushima still fresh in the public's mind, emergency responders also needed to be effective risk communicators.





Civil Air Patrol photo

Floodwaters encroach upon the Fort Calhoun (Nebraska) Nuclear Power Station in late June. NGA analysts helped officials assess potential consequences in case of power failure.

NGA's analysts incorporated Office of Counterproliferation plant design information into annotated graphics that identified the function of each building within the two energy facilities to assess potential consequences in case of power failure.

### Benefitting From the Domestic Deployment Experience

NGA launched the domestic deployment program in response to lead federal agency demand for on-site GEOINT support during long-term disasters like the Haiti earthquake, Deepwater Horizon oil spill and seasonal flooding. The NGA deployers receive specific training on how to support federal, state, local and tribal entities.

Ty Marr, an analyst in the Office of Americas' Domestic Response Branch-East, credited the forward deployment experience with improving his problem-solving skills and ability to identify and deliver on customer requirements in a rapidly changing operational environment. "As you're getting ready to deploy, you know you'll be providing real-time analysis, but you can't appreciate the demands of the operations tempo until you're there for an extended period," Marr said.


Relationship building is another benefit, according to NGA's Kenneth Oliver, an analyst in the Office of Central and Southwest Asia. "These deployments are a great opportunity to work

with NGA analysts in offices that I don't normally work with, such as the FBI, FEMA, DHS NGA Support Teams and the Office of the Americas," said Oliver.

And there is a lasting impact on the analyst's skill set, a point that Richard Manning, an analyst also with the Office of Central and Southwest Asia, hit home. "Real-world scenarios are the best teacher on what products and analyses are needed in a crisis," said Manning.

### Solidifying Interagency Collaboration for the Future

The domestic deployment team members put in action NGA's mandate to improve customer service through direct collaboration. As NGA Director Letitia A. Long said during her GEOINT Symposium keynote in October 2011: "We are embedded in our mission partner's footprint; we understand the priorities; we understand their concept of operations; and we can often anticipate what they might need before they know they even need it. That's a good thing."

Speaking from his experience in sequential deployments supporting USACE and FEMA, Pintar summed up the benefits for team members and customers alike: "If NGA had not been tied directly into the operations-intelligence fusion process, emergency planners from a variety of federal, state, tribal and local agencies would have been at a significant disadvantage. NGA truly served as the 'eyes' of the operation." 

## Leveraging GEOINT for Long-Term Humanitarian Assistance

By Kathi Ghannam, Contractor, Office of Corporate Communications

The National Geospatial-Intelligence Agency (NGA) played a pivotal role in providing disaster relief in response to the 7.0 magnitude earthquake that rocked Haiti Jan. 12, 2010.

The damage in the Port-au-Prince area was nearly unfathomable. The earthquake destroyed 75 percent of schools; many businesses and government offices, as well as hospitals and the country's medical infrastructure, ceased to exist. The postal service collapsed. Nearly 1.5 million people were displaced from their homes and as many as 300,000 died.

Within hours of notification of the disaster NGA stood up a crisis action team (CAT) to consolidate geospatial intelligence (GEOINT) efforts. The U.S. government leveraged resources across the Intelligence Community, the Department of Defense and other elements of the federal government, industry and academia to meet humanitarian assistance and disaster relief requirements. NGA personnel deployed to provide GEOINT support.

"The whole NGA team—to include key components from the East and West and members of NGA Support Teams (NSTs)—came together and used all of the tools and GEOINT capabilities that could be brought to bear," said Terri Carter, Haiti CAT focus cell lead. "From doing environmental and critical infrastructure and damage assessments, to providing imagery of ports to determine trafficability and navigability of Haiti's waterways, NGA provided situational awareness to U.S. Southern Command (USSOUTHCOM) and other decision makers so that they could emplace equipment and personnel to deliver food and medical aid."

Carter said NGA employed a holistic approach, leveraging the capabilities of the U.S. Transportation Command, the Defense Intelligence Agency and domestic and foreign partners in support of what became known as Operation Unified Response.

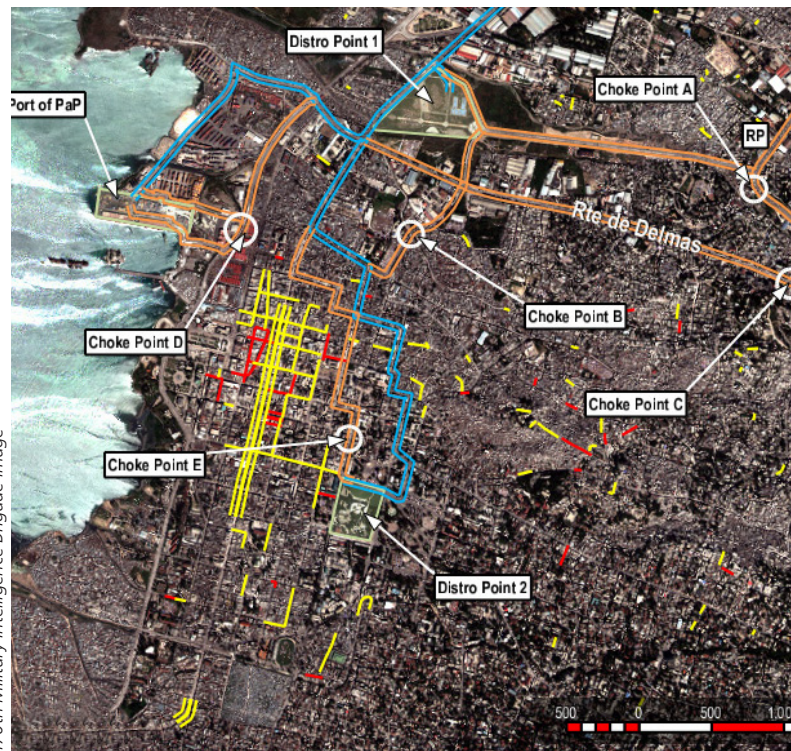
As a result, NGA was able to quickly assess the location and extent of the destruction and map medical facilities to support health-related activities, track the build-up and status of internally displaced persons (IDP) camps and follow possible mass migrations from major ports and across the Dominican Republic border.

Today, Haiti continues to pose some unique intelligence challenges.

"Due to the severity of the devastation, what began as a normal NGA rapid response in support of initial humanitarian assistance has turned into a long-term, multi-agency, multi-faceted project," said Carter. Almost two years later, NGA continues to help USSOUTHCOM leverage intelligence, surveillance and reconnaissance and commercial imagery capabilities to help in rebuilding efforts, as well as non-traditional sources of information, to inform and enrich analysis.

Though the United States and other countries have made massive contributions toward relief efforts, access to basic medical care, food and potable water have become long-term problems in what was already the poorest country in the Western Hemisphere. These were among the factors that contributed to a cholera epidemic, which started in Sept. 2010 and persists today, though at a more controllable rate. The disease

**U.S. Southern Command used GEOINT analysis to determine the status of road networks within the city of Port-au-Prince. The graphic assisted first responders and planners in providing immediate relief operations after the earthquake.**



had affected a total of 452,189 people by October 2011, with 24,932 hospitalized and 6,334 deaths, according to Brian Bertazon, GEOINT Chief, Joint Intelligence Operations Center-South, USSOUTHCOM NST.

Bertazon said analysts used GEOINT to correlate suspected IDP camps and hospitals with large numbers of patients afflicted with cholera to help direct medical supplies.

The GEOINT NGA collects helps inform groups like the U.S. Agency for International Development and the European Union—the major financing sources for reconstruction—about the progress of recovery efforts. “More than 600,000 people are still not in their homes, and at least 500 IDP camps are still in operation,” said Bertazon. But progress is apparent; analysts have seen an increase in power restoration, construction of hardened facilities and reduced numbers of camps and occupancy.

The main focus area for NGA and the IC—after health and shelter issues—is security. Haiti lacks security forces, so GEOINT capabilities are tracking activities such as crime patterns, in addition to accessibility to life-sustaining services and supplies, to predict and track possible mass migration.

In addition, with a fragile government, decimated infrastructure and infamously corrupt Haitian National Police, a key concern for decision makers in the United States and across the international

community is whether or not Haiti—which elected a new president in March 2011—will become a failed state.

“If these issues are not managed strategically, the result could be an influx of refugees to the shores of the U.S., neighboring Caribbean countries and other Western nations which could wreak widespread economic havoc,” said Carter.

The breadth and scope of supporting this disaster has enabled NGA to amass valuable lessons learned that analysts can apply to GEOINT tradecraft, policies and practices, said Carter. “The Haiti experience has been a pivotal episode that helped define where we (as an agency) needed to go.”

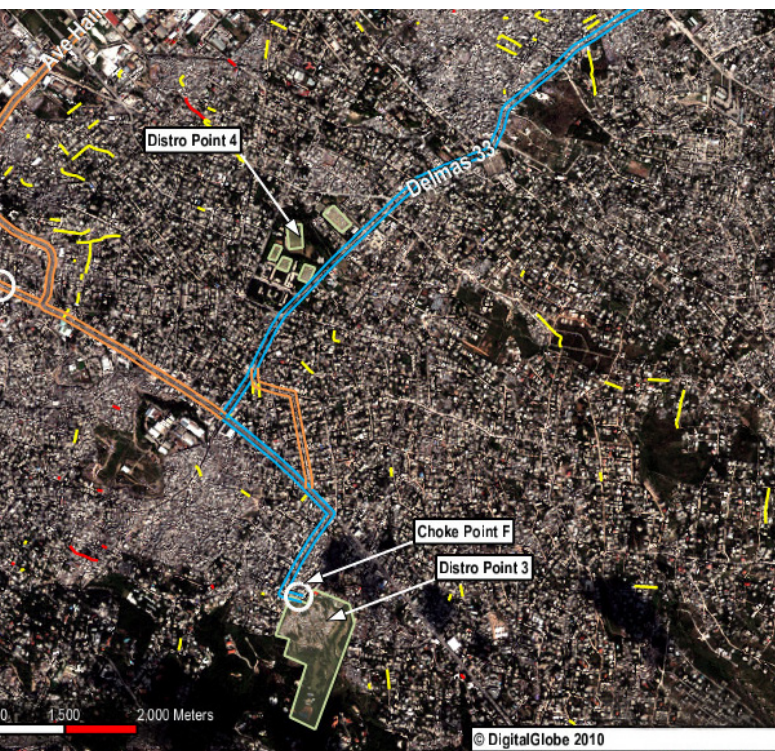
As a result of ongoing after-action reporting and inter-agency data sharing, best practices have emerged that have helped define capability gaps, according to Carter. These lessons learned and other observations informed NGA’s vision and subsequently its strategic initiatives.

“The identification of those capability gaps helped to define GEOINT users’ needs,” said Carter.

“The Haiti CAT became very adept at laying down the fundamentals for mission planning and execution in a crisis situation,” said Carter. “We had good concepts, and now we are looking to leverage those concepts into new and better ways of doing business.”

For instance, dealing with the Haitian crisis highlighted the need to make information accessible when communicating with non-Intelligence Community mission partners. The CAT made a concerted effort to keep the maximum amount of GEOINT content at the unclassified level and therefore quickly releasable and accessible via the NGA website, giving GEOINT users access to what they needed, where they needed it and when they needed it.

Getting the information onto unclassified networks and to users quickly is crucial to disaster support. In Haiti NGA created electronic map books using handheld devices, said Carter. “NGA immediately began producing and posting commercial imagery and pushing it out via apps,” said Carter. “There were unprecedented amounts of intelligence reports created and pushed out on the low-side (unclassified network) about Haiti, a precursor to the capabilities being delivered in support of the online, on-demand goal of the NGA vision.”



# NGA-FEMA Cooperation Embraces New Practices, Emerging Technologies

By Mario Iván Oña, Contractor, Office of Corporate Communications

After 64 tornados indiscriminately ripped through Alabama April 27 in one of the most violent tornado outbreaks ever recorded, the Federal Emergency Management Agency (FEMA) had to respond quickly. The tornados' 620-mile path devoured 23,000 homes and claimed 249 lives—moms, dads, sons, daughters, sisters and brothers.

"You'd turn a corner or crest a hill and it looked like [a nuclear bomb had exploded]," said Michael Byrne, FEMA National Incident Management Assistance team leader, during the Environmental Systems Research Institute, Inc. Homeland Security Summit in San Diego in July. "The level of devastation was just unthinkable. It was chaos ... the house across the street was fine, but the next house, completely destroyed."

Remarkably, within 70 days, 85 percent of the estimated 10 million cubic yards of debris was picked up as part of Operation Clean Sweep, said Byrne about the FEMA program, which determined areas eligible for cost-sharing debris removal based on extent of damage.

"That's impressive," he said. "How did we do it? This is where Nat [Wolpert] and Katie [Baucom] from the National Geospatial-Intelligence Agency come in. I can't thank you enough. You guys were able to target where the impact was using imagery. In the past, this would have taken many, many months to complete."

NGA's geospatial imagery helped "make rapid assessments" and identified "areas with the most catastrophic damage," said FEMA Administrator Craig Fugate during a July 14 congressional hearing. NGA analysts correlated areas where catastrophic and extensive damage had occurred and captured that information in a database.

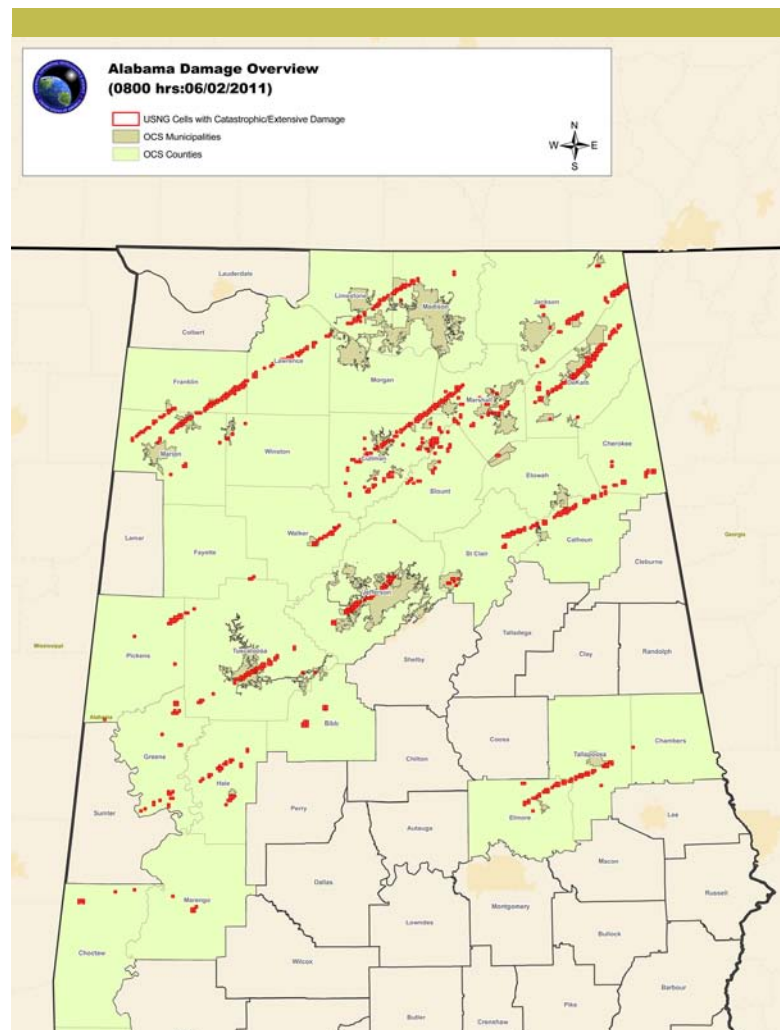
"Operation Clean Sweep revolutionized the speed of debris assistance to disaster survivors," said William L. Carwile III, FEMA Search and Rescue associate administrator. "FEMA utilized a 90-10 cost share through the use of GIS (geographic information system) technology that greatly improved our ability to expedite debris removal. The result was people got back in their homes faster, and communities recovered swifter from these destructive disasters."

There was also Haiti's massive 7.0-magnitude earthquake in 2010. If Alabama set a precedent for using geospatial information to expedite post-disaster efforts, Haiti demonstrated how geospatial information could be used in predictive analysis.

NGA's work in Haiti possibly saved 37,000 lives, said Byrne. Geospatial analyses confirmed that following the earthquake, 37,000 of the 2 million displaced people had self-relocated to areas with a high probability of landslides and flashfloods come rainy season.

"Unless we did something we were going to have a second wave of deaths," said Byrne. "Let's remember that 320,000 people had already died."

A task force including the Haitian government, U.S. Southern Command, international agencies and volunteer organizations used a mapping



Red dots identify the hardest-hit areas following the Alabama tornados.

strategy to thwart the impending catastrophe. It seemed that, at its best, geospatial information can be the international language of efficient and effective emergency management.

“We were able to communicate without worrying about terminology because we used maps and imagery,” said Byrne. “In some areas, we had to engineer and build pathways for the water to go. This effort to bring in heavy equipment, put roads in and put drainage ditches in was done by the [U.S. Navy] seabees, Brazilian engineers and South Korean engineers. Even though we were languages apart, we were able to work together because we were able to show imagery. We were able to show where the work needed to be done. The visuals spoke to everybody.”

In essence, geospatial information provided a common operating picture, crucial when considering the highly complex and excruciatingly difficult task emergency responders faced—a task with a degree of difficulty commensurate to the devastation’s magnitude. Goodwill and well-intended humanitarian effort could prove debilitating if not properly coordinated.

In Haiti, for example, there were approximately 60 search and rescue teams from across the globe. How were they supposed to cut through the bureaucratic bottlenecks, cultural differences and language barriers and get eager volunteers with different search and rescue methodologies working together? And how do they do that with zero time to spare, since every minute spent could be another life lost?

“You gotta organize them,” said Byrne emphatically. “You can’t just have them going willy-nilly to where they see a pile of debris and jump on it.”

Using NGA imagery and maps with overlays, FEMA divided the devastated area into grids and assigned them to various teams. This gave the teams focus. It set boundaries. It gave them the go-ahead, said Byrne.

### **Moving Forward**

While advances in geospatial information and technology rendered some positive outcomes in Alabama and Haiti, more needs to be done because time can be especially unforgiving during disasters. Consequently, NGA and FEMA are “working aggressively” to do more—as Fugate told a congressional Homeland Security subcommittee Oct. 25.

A key driver toward nimbler geospatial information-emergency management collaboration is President Obama’s “National Preparedness” Presidential Policy Directive 8 (PPD8), signed March 30. “Our national preparedness is the shared responsibility of all levels of government, the private and nonprofit sectors, and individual citizens. Everyone can contribute to safeguarding the nation from harm. As such, while this directive is intended to galvanize action by the federal government, it is also aimed at facilitating an integrated, all-of-nation, capabilities-based approach to preparedness,” the directive states.

The directive formally prescribes a shift in emergency response management toward the concept of crowd sourcing and “whole community,” where affected citizens, who are the very first responders during any disaster, are empowered and armed with the tools to act, said Byrne.

“This need for collaboration between geospatial information and emergency management is recognized within the White House, but also across the emergency management community,” said FEMA Whole Community advisor Michael J. Gresalfi, Ph.D. “In fact, this demand for GEOINT tools and knowledge is identified in the National Preparedness Goal [directed by PPD-8] published in September. From public information and warning to operational communications, the demand for these tools to make more timely and accurate decisions during a disaster is a no-brainer.”

Philip Plack, NGA liaison to FEMA, said, “PPD8 builds on the ‘whole community’ concept. One of the key principles of building core capabilities is to confront any challenge, which is one of the pillars of [NGA’s] support to FEMA. Through a variety of initiatives, we’re looking to increase FEMA’s internal [GIS] capacity, enabling them to establish a more robust GEOINT production capability and serve more of their stakeholders’ needs.”

There’s also a desired domino effect: after NGA furnishes FEMA with the tools and know-how to develop specialized geospatial products help themselves, FEMA—embracing the “whole community” concept—can then virtually deputize citizens to be effective first responders and active stakeholders in their own communities.

Specifically, within the NGA vision is the disaster support initiative (DSI), one of eight strategic


initiatives introduced in August. The goal of DSI is to help save lives by improving the efficiency and effectiveness of mission partners' use of GEOINT in determining where help is most needed, getting the right people to the right place at the right time, and anticipating what might happen next.

"The relationship between FEMA and NGA is improving rapidly as we move forward with the disaster support initiative," said Nat Wolpert, NGA Disaster Response team lead, who regularly deploys to disaster areas to provide onsite support. "Within the DSI we have made great strides utilizing many different technologies to improve our support to disaster response and homeland security."

One of the highlights of the recent GEOINT Symposium held in mid-October in San Antonio was NGA Director Letitia A. Long's introduction of several mobile applications designed to deliver the NGA vision's promise: providing "online, on-demand access to our GEOINT knowledge."

Among the apps presented and currently under development are five urban search and rescue apps, which will provide emergency management personnel with easy access to geospatial information and also a mobile common operating picture vehicle, which they can populate with updates and facilitate coordination. One of the apps, which will use social media principles to allow citizens to stay informed and provide updates, will align with the whole community concept.

"With these mobile devices we're not just receivers of information, we are also providers," said Byrne. "What we can do now with small, handheld devices was unimaginable 10 years ago."

Emergency management is effectively a race against time. The NGA-FEMA partnership is relentless in its quest to do more, better, faster. The two agencies are students of each passing disaster. They learn and build from each of them. They do not cling to old, albeit reliable, practices. They do not have the luxury of being inefficient. Lives depend on them. They are embracing new technologies to find new, innovative ways to respond to crises, which is good news for everyone. 

## NGA, Coast Guard Launch Self-Service GEOINT Initiative

By Wayne Stephenson, Staff Officer, Department of Homeland Security NGA Support Team

"We make better decisions faster than before," said the Coast Guard District 11 Intelligence Officer James V. about the National Geospatial-Intelligence Agency (NGA)-Coast Guard self-service geospatial intelligence (GEOINT) initiative.

"The Self-Service GEOINT guide allows my staff and me to develop GIS [geographic information system] products for intelligence analysis, operational planning and tactical display," said James. "Our command center law enforcement duty officers are using Google Earth to feed in a variety of near-real time data. Combined with the customized overlays we develop using arcMAP [software to view, edit, create and analyze geospatial data], their desktop screen becomes a tactical tool that delivers the right intelligence and operational information to the people who need it, when they need it."

Coast Guardsmen in the field have always had to collect, display and analyze information geospatially. In the past, watch standers and command staff would plot information on maps and charts to provide commanders the situational awareness they needed to respond to disasters, locate vessels in distress, interdict smugglers and navigate safely through the vast maritime domain.

Some of today's most challenging maritime threats include piracy, illegal immigration, smuggling, terrorism, arms proliferation and the emerging semi-submersible vessels. With 95 percent of U.S. international commerce moving through U.S. ports, the nation's economic health depends on the security of its coasts, ports and inland waterways. Situational awareness is vital to ensuring this security, and the Department of Homeland Security National Geospatial-Intelligence Agency Support Team (DHS NST) is helping Coast Guardsmen in the field develop the skills to ensure it.

"The best part of the self-service GEOINT initiative is that it is catered towards specific Coast Guard missions," said Coast Guard District 7 Intelligence Officer Lt. j.g. Emily H. "With the

support of the DHS NST I am able to quickly create and update products with a few mouse clicks. Also, I've taught my coworkers what I've learned using the self help guides as a reference and now they are teaching others. Soon the ability to plot and analyze data geospatially will be common practice in all CG mission areas."

The DHS NST supports the third largest Cabinet department, one with over 230,000 personnel. Reachback, partnerships and unified geospatial operations are key to the NST's successful accomplishment of its mission. The size of the Coast Guard, diversity of missions and geographical span challenge the NGA team daily.

In line with the NGA Director's vision of putting the power of geospatial intelligence in users' hands, the NST teamed with the Coast Guard GEOINT components to launch a self-service GEOINT initiative last year. The goal of this initiative has been to empower the tactical intelligence officers in the field with the knowledge, tools and data to more efficiently integrate GEOINT into their daily tasks. This enables them to complete first order analysis on raw information they collect in the field.

The core components of this initiative are the self-service GEOINT guides that the NGA/Coast Guard GEOINT Team has been developing. These guides are mission specific and walk the user from start to finish through the processes to generate situational awareness products supporting operational commanders.

Through their outreach, the team discovered that many of the Coast Guard field units were using familiar tools such as PowerPoint and Google Earth to geospatially analyze data and information. The team developed a GEOINT Starter Kit to introduce additional self-service tools such as ArcGIS Explorer, Palanterra and Arc GIS Desktop. The kit also provided information on where to acquire basic foundation data sets such as the NGA Geospatial Intelligence Base for Contingency Operations (GIBCOs), the Web-based Access and Retrieval Portal (Warp) and the Homeland Security Infrastructure Program (HSIP) database.

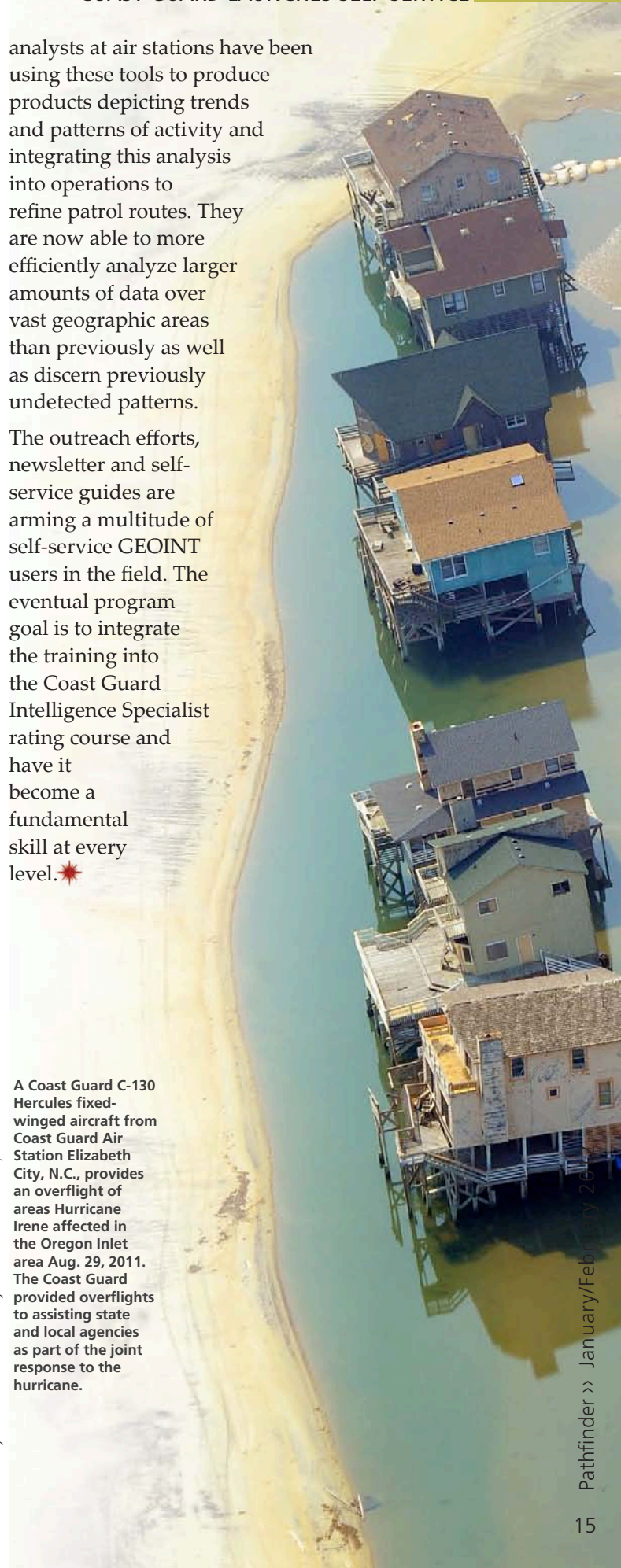
The team has additionally published five task-specific guides to address missions such as illegal fishing, illegal migration and connecting to an Access database. A quarterly newsletter shares geospatial analytical lessons learned by tactical intelligence officers in the field. For example,

analysts at air stations have been using these tools to produce products depicting trends and patterns of activity and integrating this analysis into operations to refine patrol routes. They are now able to more efficiently analyze larger amounts of data over vast geographic areas than previously as well as discern previously undetected patterns.

The outreach efforts, newsletter and self-service guides are arming a multitude of self-service GEOINT users in the field. The eventual program goal is to integrate the training into the Coast Guard Intelligence Specialist rating course and have it become a fundamental skill at every level. ✨

Photo by U.S. Coast Guard Petty Officer 3rd Class Stephen Lehmann

A Coast Guard C-130 Hercules fixed-winged aircraft from Coast Guard Air Station Elizabeth City, N.C., provides an overflight of areas Hurricane Irene affected in the Oregon Inlet area Aug. 29, 2011. The Coast Guard provided overflights to assisting state and local agencies as part of the joint response to the hurricane.



# NGA Focuses on Earthquake Relief in Japan

By Jeff Redinger, Staff Officer, Office of the Americas

On March 11, 2011 a devastating 9.0 earthquake shook the Japanese mainland. The earthquake was so powerful it shifted parts of the island to the east by as much as 8 feet, shortened the length of a day and shifted the Earth's axis slightly. The earthquake caused immediate and severe damage to eastern Japan's transportation system, power supply and buildings. But the ensuing tsunami waves caused the majority of the damage and loss of life. These waves, some as high as 40 feet, tore into the eastern coast and its bays for hundreds of miles north and south of the epicenter. As the news and dramatic footage of the natural disaster started to flow, it was clear the earthquake had dealt Japan—a major U.S. ally—an incredible blow.

A day later, the looming nuclear disaster at the Fukushima Daiichi plant added a new dimension and focus to the natural disaster and the National Geospatial-Intelligence Agency's (NGA's) support mission.

NGA has been responding to and supporting natural disasters around the world for years. The use of geospatial intelligence (GEOINT) has proven to be the most effective way to assess damage quickly and provide first responders, decision makers and relief agencies with the information required to plan a disaster response mission. Within hours of the tragedy, NGA organized a focus cell to deal with the crisis. The Offices of the Americas and Asia Pacific and the Pacific Command NGA Support Team led the cell. In its first 24 hours the cell executed its source collection plan, established 24/7 support, organized technical and analytical expertise and began responding to customer requests.

"This was the fastest moving and most complex disaster mission I have ever worked," recalled Bob Jensen, focus cell lead. Within hours of the cell's standup, it received urgent requests for GEOINT and products from all levels of government.

NGA used the full breadth of its analytical and technical capabilities, quickly assessing damage to the Fukushima nuclear reactors, roads, bridges, rail lines, power generation, dams,

ports/harbors and airports/airfields. NGA mapped the extent of the damage the tsunami caused. Analysts used these assessments to provide the framework for the U.S. government's response, titled Operation Tomodachi—"Operation Friendship."

During the first few weeks after the disaster NGA received urgent product requests from numerous customers, including the Director of National Intelligence, Department of State, Department of Energy, Nuclear Regulatory Commission, Defense Threat Reduction Agency, U.S. Forces Japan, U.S. Embassy Tokyo, White House, government

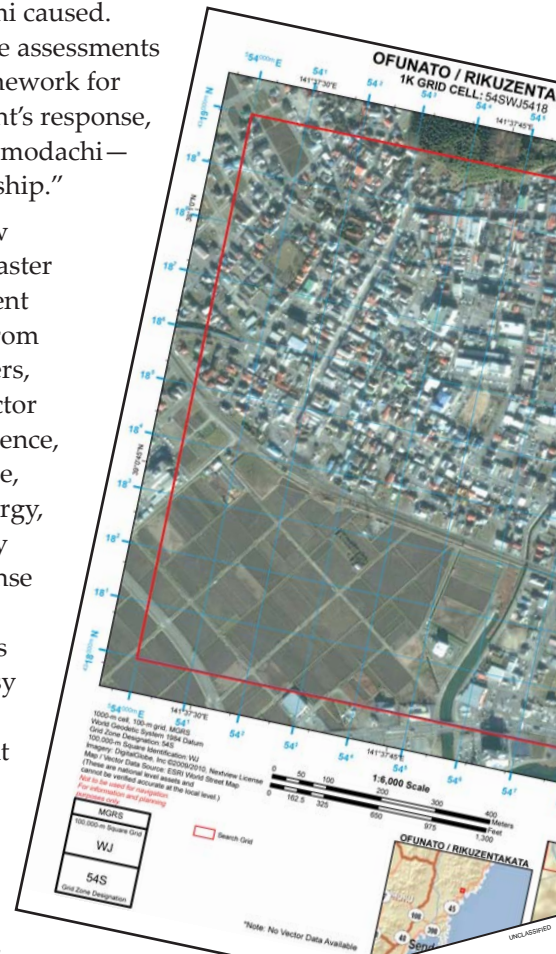


Image 1 depicts the residential Ofunato/Rikuzentakata area before the tsunami hit.



Image 2 shows the extent of the damage to this area after the tsunami waves scoured the land surface of all but a few of the sturdier structures.



of Japan, Centers for Disease Control and Prevention and Department of Defense. Fairfax, Va., and Los Angeles County Urban Search and Rescue (US&R) teams used NGA-provided digital map books that not only aided search and rescue missions but also had many unintended uses.

“We had no idea how useful these products would be to others responding to the crisis outside of the search, rescue and recovery mission,” said Matt Gamm, who served on the Office of Americas team that produced the 23 books. “Once these books found their way to the first responders and were shared with others on the ground we found that NGA was the only agency graphically depicting what infrastructure looked like pre- and post-tsunami.”

Marines “tasked in the air” in support of the relief mission noted that in this very dynamic environment NGA’s products provided necessary situational awareness about flight conditions despite overcast skies. Said the Misawa Marine representative, “Your [NGA] products have been excellent and we have provided copies to them [pilots] for baseline imagery. We are also providing them to Navy teams conducting salvage operations along the coast. Bottom line is the products are awesome.”

NGA State Department representatives provided feedback from the scientific community, which noted NGA products would enable fieldwork to document the tsunami water levels and sediment deposits in Japan, while the Japan Aeronautical Exploration Agency (JAXA) e-mailed their thanks. Volunteer-produced products “helped us during the emergency phase ... with details of changes between before and after using high resolution satellite images,” said the JAXA representative. “[This] information is very much useful at local government because [the] tsunami washed away tons of information.”

“In Tokyo, we felt the quake, but no significant damage occurred in our region,” said Aaron B., an International NGA Support Team Japan representative who voluntarily stayed on the island despite radiation safety concerns. Noted Aaron about conditions in Japan, “There is just a new definition for normal in Japan and a new normal for Japan/U.S. relations. All in all, the GEOINT relationship with Japan was bolstered by our support, [and] the products received were very timely and useful.”

NGA’s ability to produce time-dominant products and information to the U.S. government and an ally for this crisis provided many lessons learned that analysts can apply to future disasters. These lessons can be applied to the ever-growing need for GEOINT, NGA’s unique capabilities and a workforce ready to respond to natural and manmade disasters. ✨

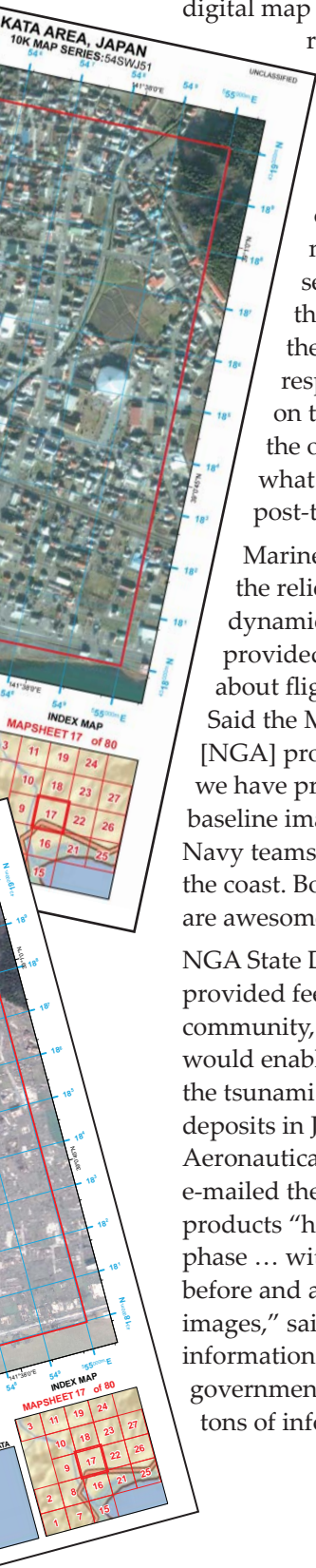
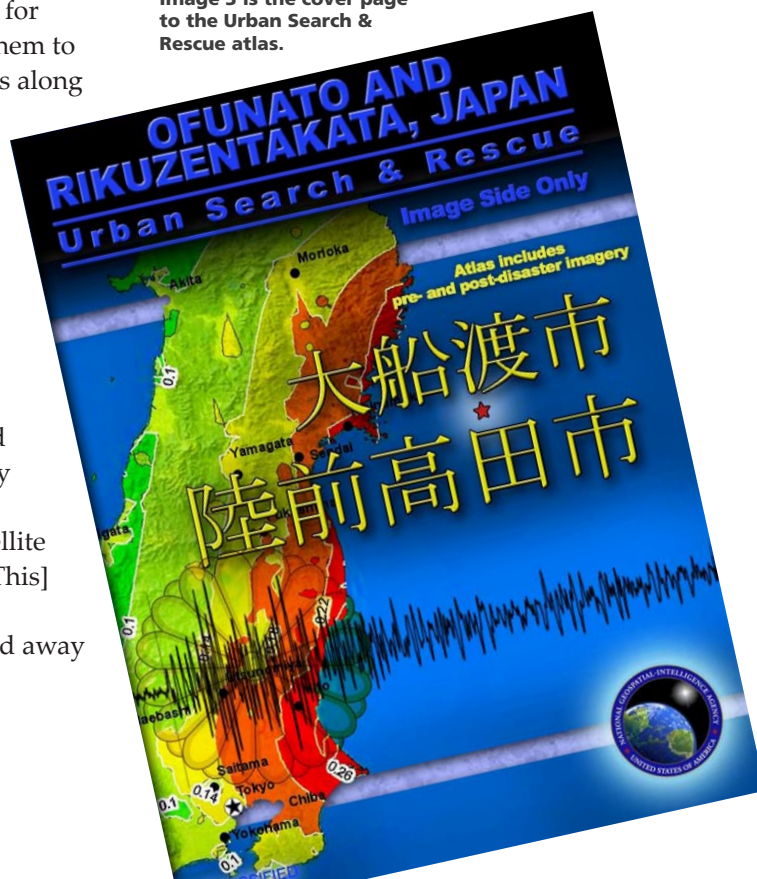


Image 3 is the cover page to the Urban Search & Rescue atlas.



## NGA Point of Distribution Enables Commercial Access

By Bob Hicks, Technical Executive, Office of the Americas

National Geospatial-Intelligence Agency (NGA) Point of Distribution (POD) allows customers to access NGA's homeland security commercial airborne imagery online and on-demand—a fitting example of self-service access to NGA data. NGA analysts and domestic partners such as the Federal Emergency Management Agency, as well as first responders, use this imagery service during domestic disaster response.

The NGA POD at the U.S. Geologic Survey (USGS) Earth Resources Observation and Science (EROS) Data Center is the result of a longstanding partnership between NGA's Office of the Americas (PM) and USGS. "The POD exists because

someone wanted to know what would happen if NGA leveraged the USGS's National Map, a program that already has both imagery storage and Web services available,"

said Bill Nellist, project lead for the North America and Homeland Security Division (PMH) 133 cities imagery project.

"The NGA POD replaced thousands of DVDs and hundreds of portable hard drives in the agency's catalog," said Drew Herrick of the Vision Integration Team.

After 9/11 PMH and USGS developed the Homeland Security Infrastructure Program (HSIP). A clearinghouse of mission-critical geospatial and remote-sensing foundation information, HSIP data collection includes the procurement of unclassified imagery over the 133 highest-priority American metropolitan areas. NGA shares this unclassified imagery, which supports a common operational data framework, with its domestic mission partners at the federal, state, local and tribal levels. Leveraging existing co-production agreements, such as HSIP, PM partnered with the USGS to acquire commercial airborne imagery, said Steve Alness, chief of NGA's Domestic Preparedness Branch.

Working with USGS, PM developed a strategy for NGA to provide funding for USGS to manage the contracting and processing of airborne imagery over areas of interest, said Nellist.

"The USGS works with its state liaisons to leverage funding to seed other partnerships," said Douglas Binnie, USGS Information Solutions Team chief. The partnerships allow NGA to get four square miles of coverage for every square mile it purchases.

However, this workflow required PMH analysts to manage the organization, cataloging, storage, access, duplication and dissemination of imagery to mission partners. It became apparent that this business model was unsustainable, said Nellist.

In 2009 the situation reached critical mass; there were more than 21,000 DVDs and over 300 portable hard drives in the catalog, more than NGA had space to store and analysts to manage. NGA needed a solution.

Herrick, former technical executive for the Office of the Americas, worked with the eGEOINT Management Office to establish an alternate business model, one that relied on self-service through interoperable Open Geospatial Consortium-compliant Web services. PM and USGS purchased Web servers and placed them at EROS to serve online, on-demand imagery. Then-director of PM Liam O'Brien agreed to fund these servers—the NGA POD. Also, eGEOINT consulted on the creation of the POD Web Mapping Service (WMS), the service that provides the data. This architecture allows data to be stored in one location and, through NGA servers, ensures that public and NGA activities do not impact each other, said Herrick.

NGA launched POD in April 2010 to enthusiastic use by analysts. Said Nellist, "It was surprising just how quickly almost everyone accepted the new processes for accessing our imagery." During the Deepwater Horizon support effort "USGS was able to quickly add ad hoc crisis imagery to the WMS," said Nellist.

According to Karl R. of the eGEOINT Management Office, "In addition to being more accessible, data under this architecture is also more secure, further providing benefit. Web services such as this limit customers to 'sipping' only the data they need instead of downloading and locally storing massive amounts of information. This protects the data and frees up networks. Also, the WMS is able

**"The NGA POD replaced thousands of DVDs and hundreds of portable hard drives in the agency's catalog," said Drew Herrick of the Vision Integration Team.**

# Downtown New York City

to track frequency of access, track behaviors and interests of individuals and restrict access, enhancing security.”

The success of this project has demonstrated the power of Web services and is changing how agencies do business. Said Binnie, “Since the implementation of the POD, the FEMA Flood Map Modernization activity has also implemented a similar POD. Bureau of Census is considering it as well. This collaboration between NGA and USGS certainly does a good job in validating the need for these data and the fact that it is used by multiple agencies from a single source speaks to the work being done to make access mechanisms efficient and easy to use.”

By adhering to service-oriented architecture principles, the NGA POD, a joint, collaborative venture, has aligned with the NGA Vision of “putting GEOINT in the hands of our users” and has inspired partners to investigate similar avenues. The NGA POD represents just one step in a much larger strategy that will allow NGA to more effectively provide all of HSIP through a self-service environment. ✨

USGS High Resolution Orthomagey



This image of Lower Manhattan is an example of the high-resolution, commercial airborne, color imagery from our HSIP holdings for the 133 cities hosted on the Web Mapping Service at the USGS EROS Data Center.

The NGA Vision of “putting GEOINT in the hands of our users” has inspired partners to investigate similar avenues.

## Working Group Enables Sharing of Common Operational Data

By Steven Alness, Chief, Domestic Preparedness Branch, North America and Homeland Security Division

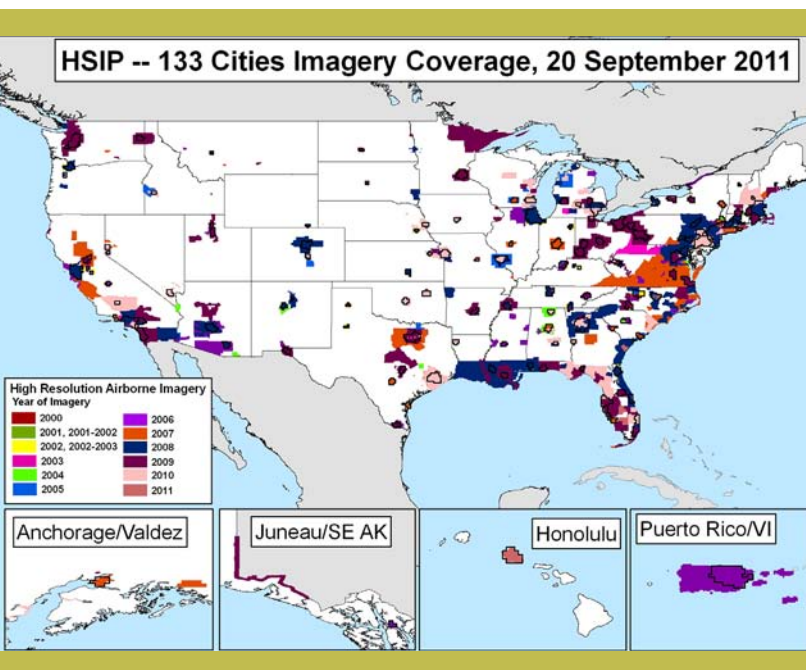
The Homeland Infrastructure Foundation Level Data (HIFLD) working group coordinates the acquisition and dissemination of infrastructure data—such as the location of road networks, schools, hospitals and power plants—to aid federal, state and local mission partners and first responders. The National Geospatial-Intelligence Agency (NGA) manages this geospatially enabled infrastructure data within the Homeland Security Infrastructure Program (HSIP) Gold and HSIP Freedom database.

assessment and shared situational awareness at all levels in support of the homeland security, homeland defense, emergency preparedness, response and recovery missions. The database also includes the HSIP 133 Cities imagery and light detection and ranging (LiDAR) data supporting steady state operations, national level exercises, national special security events and national responses, such as Hurricane Irene and Midwest region flooding.

During Hurricane Irene analysts used HSIP data to create geospatial situational awareness and risk assessment products for decision makers and emergency responders. The products visualized the potential impact to the East Coast and evacuation routes, the actual impact on infrastructure and personnel from flooding and the status of recovery operations.

NGA expanded the HIFLD partnership in 2009 to include HIFLD to the Regions (HTTR). HIFLD to the Regions fosters partnerships across the government and private sectors to increase the use of common geographic infrastructure data for the protection, response, recovery and restoration of infrastructure assets that natural or man-made disasters impact. Government organizations working in the same mission space share programs, tools, data and products—a significant resource efficiency. The HIFLD and HTTR staffs located around the country support the coordination, continuous improvement and dissemination of the HSIP data and the sharing of best practices across government.

The HIFLD and HTTR leaders from DOD, NGA, DHS and USGS continue to work together to improve getting GEOINT into the hands of the users as efficiently and effectively as possible. For additional information on the HIFLD partnerships and HSIP data, visit [www.hifldwg.org](http://www.hifldwg.org), watch the HSIP/HIFLD video at <http://www.youtube.com/watch?v=IEhjN2y-o54> or contact the NGA HSIP Team at [HSIP\\_Team@nga.mil](mailto:HSIP_Team@nga.mil).



This graphic depicts imagery coverage of the 133 cities available on the NGA point of distribution system.

The working group has grown since its February 2002 inception, from 13 initial members to 4,457 contributing partners, representing the 14 executive departments, 94 agencies, 50 states and more than 700 private sector organizations. The group enables the Department of Defense (DOD), NGA, Department of Homeland Security (DHS) and U.S. Geological Survey (USGS) to provide enhanced support to more than 148,000 federal, state and local mission partners and first responders.

The database includes more than 450 infrastructure and other foundation data layers. Partner agencies use this data to create geospatial products for planning, training, impact

## The 66th UN General Assembly: NGA Showcases Integration of Mobile Devices

By Vivek Venkatesh, NGA Liaison to the U.S. Secret Service, Department of Homeland Security NGA Support Team

The National Geospatial-Intelligence Agency (NGA) continuously adapts its resources and capabilities to support its federal mission partners; NGA support of the Department of Homeland Security includes support of the U.S. Secret Service. In September 2011 this included deployment to the 66th U.N. General Assembly in New York.

The Secret Service provided security and conducted protective operations for over 134 dignitaries, including the president and vice president of the United States.


The Department of Homeland Security NGA Support Team embedded two analysts with the Secret Service to provide onsite geospatial support. They served as geospatial information brokers and provided geospatial intelligence (GEOINT) for security planning and counterterrorism operations. In this role, analysts provided traditional GEOINT products, such as event-tailored maps and imagery, while integrating non-traditional, dual-faceted GEOINT support through the Hermes mobile and Web applications.

The InnoVision Geospatial-Intelligence Advanced Testbed created the Hermes app, a mobile device interface that allows users with smartphones to share events and pictures through a common operating picture. The app incorporates both mobile device and Web applications.

Although simple in concept, the Hermes is revolutionary because it integrates various levels of users into a single common operating picture, ensuring that all parties involved are on the same page. Hermes gives tactical level users (i.e., those with the mobile devices) the ability to take geospatially tagged images. This functionality provides the central command post, as well as geographically diffuse tactical users, with the ability to share data and information in real time while adding the context of location. Hermes provided the Secret Service leadership with enhanced situational awareness; leaders could quickly locate incidents, determine the severity and leverage appropriate resources to respond to them. Furthermore, Hermes provided leadership awareness with regard to location

and disposition of organic resources, invaluable during the event and critical to significantly reducing response time.

To understand Hermes it is important to understand the associated network architecture. The mobile devices rely on wireless connectivity to interface with the protected network in which Hermes resides. Access requires authentication into the Director of National Intelligence enclave via Intelink Remote Access, and then into the NGA enterprise network. This concept provides security in the form of dual authentication, thereby mitigating mission partner concerns regarding information security.

Hermes is an evolution in how geospatial information and intelligence is collected and disseminated. It integrates the “beat on the street” into the operational picture and facilitates a dramatic improvement in the development of an appropriate and precise response. In short, through a mobile device, it gets the power of GEOINT into the hands of users. 



The image shows part of the display of the HermesWeb application. It illustrates the ability of HermesWeb to allow a picture to be geographically placed, referenced and displayed in the application window. This image was a screen capture at the 66th U.N. General Assembly in which analysts were deployed with the U.S. Secret Service in the Protective Intelligence Coordination Center.

# Remembering Vietnam 5: Staying Ahead of the Curve

## Early Cartographic Work in Vietnam, 1965-1966

By Dr. Gary E. Weir, Office of Corporate Communications

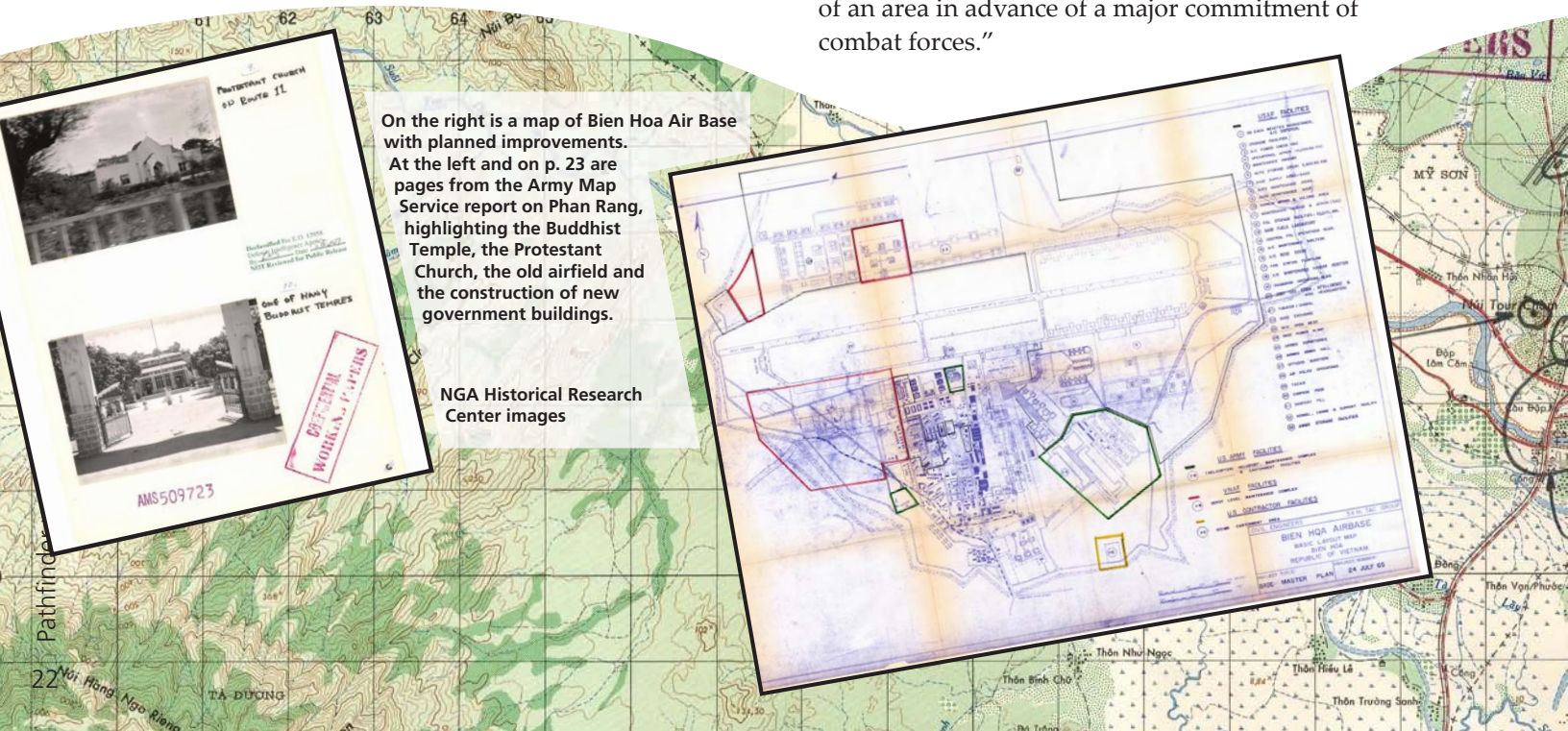
On the 50th anniversary of the first direct American military involvement in Vietnam, the Department of Defense (DOD) has called upon U.S. citizens to remember with respect and gratitude those who served in Southeast Asia. This series of six articles—of which this is the fifth—illuminates the significant role people in the tradecraft communities that now comprise the National Geospatial-Intelligence Agency played in Southeast Asia.

As a rule, staying ahead of the curve always presents a difficult professional challenge. For American cartographers, the changing situation in Southeast Asia after World War II would prove this rule. As the Eisenhower Administration began to commit the United States to an anti-Communist advisory role in Vietnam in the 1950s the Army Map Service (AMS) discovered a major cartographic problem: the comprehensive maps of Vietnam the colonial French administration produced had become dated and showed signs of inaccuracy. How could the U.S. Army conduct advisory operations in this country with inadequate maps? Unfortunately, AMS maps did not appear much better and few sources existed to inform any program to revise the existing

1-50,000 ratio topographic maps and 1-250,000 ratio aeronautical charts.

AMS addressed the problem in 1956 by entering into a cooperative mapping agreement with the newly formed Republic of South Vietnam. American and Vietnamese cartographers and surveyors conducted topographic and geodetic surveys and took extensive numbers of aerial photographs to build a considerable knowledge base for the reconstruction of comprehensive maps of the country. They also collected place names and collaborated in choosing the natural and cultural features that would appear on the maps. Unlike similar work the Inter American Geodetic Survey in Latin America undertook at the same time, the collaborative Vietnam mapping project came to an end in 1962 because of the increasingly dangerous communist insurgency in South Vietnam.

However, during the six years of cooperative agreement the AMS used the new data to complete a revision of its large- and medium-scale maps, prompting Army Maj. Gen. Robert R. Ploger to comment in his book on the Army engineers in Vietnam that this “marked the first time that the American military mapping agencies had completed large- and medium- scale mapping of an area in advance of a major commitment of combat forces.”



On the right is a map of Bien Hoa Air Base with planned improvements. At the left and on p. 23 are pages from the Army Map Service report on Phan Rang, highlighting the Buddhist Temple, the Protestant Church, the old airfield and the construction of new government buildings.

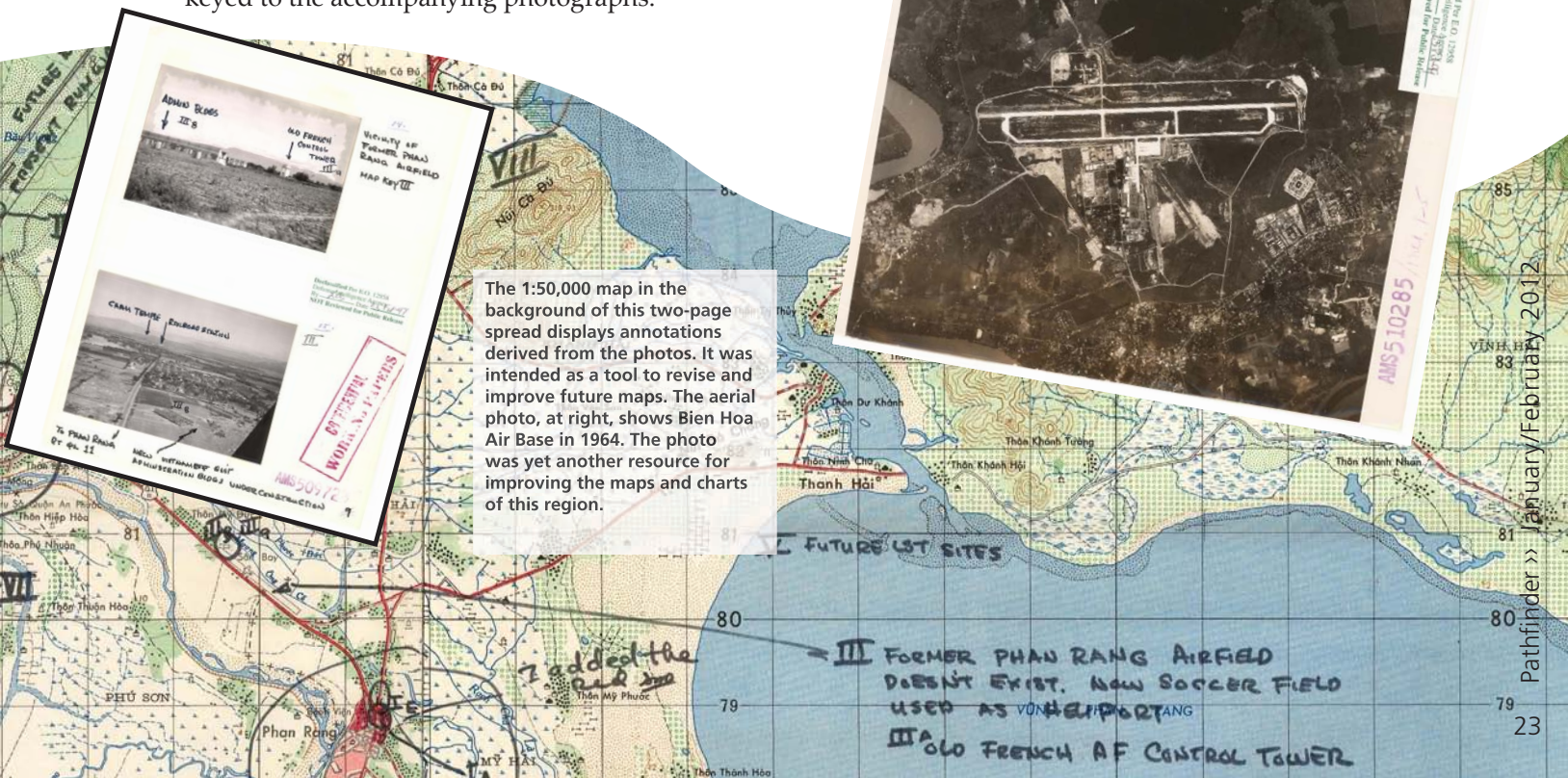
NGA Historical Research Center images

Once the American commitment began to accelerate significantly, especially in 1965 and 1966, so did the collection of data. Ground surveys in the south and aerial photography all across the divided country kept the large-scale maps current. In months to come more precise maps would inform new tactics and weaponry.

This data collection came to AMS as Intelligence Information Reports that could cover everything from a proposed airfield to the extension of a university campus, to the location of quarries and many other even more precise details. The March 18, 1966, AMS report on the Phan Rang area of Ninh Thuan province included bridges, main roads and highway routes and details on the city of Phan Rang. Annotated photos marked the Catholic Church, the city square complete with its monument, provincial headquarters, a hospital and the railway station sitting outside the city in an open field seemingly in exile. In addition to the Buddhist temples and the Protestant church, the collected details included a soccer field that doubled as a helicopter landing area and its French control tower, as well as recent flood damage to a school. The report paid particular attention to the railway network and a shore location that would accommodate shallow draft naval vessels. The report packages AMS personnel prepared usually included a 1:250,000 aeronautical chart and a 1:50,000 map, both keyed to the accompanying photographs.

In many cases, these early data collections enhanced cartographic renditions of areas that would become vital to the American effort in Southeast Asia. A report AMS compiled on April 6, 1966, focused in part on Bien Hoa Air Base, 15 miles north of Saigon, provided greater detail on the location through which the U.S. Air Force would begin its work in Vietnam, both in attack and reconnaissance support. The report indicated that a new parallel runway would soon complement the main airstrip. The accompanying 1:50,000 topographic map, keyed to the photographs in the report, also demonstrated the various locations south of Bien Hoa that would play a role in the increasing commitment, providing space for an infantry school, a training area and sites for military staging activity.

This basic cartographic effort formed a vital source of timely in-country knowledge at a critical time for American defense policy in Asia. The resulting maps and charts, far more accurate than the imperial French versions, first supported the military assistance groups DOD sent to Vietnam and then the much more ambitious commitment of the Johnson administration to address the communist threat in Vietnam. 🌟



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