

THE NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

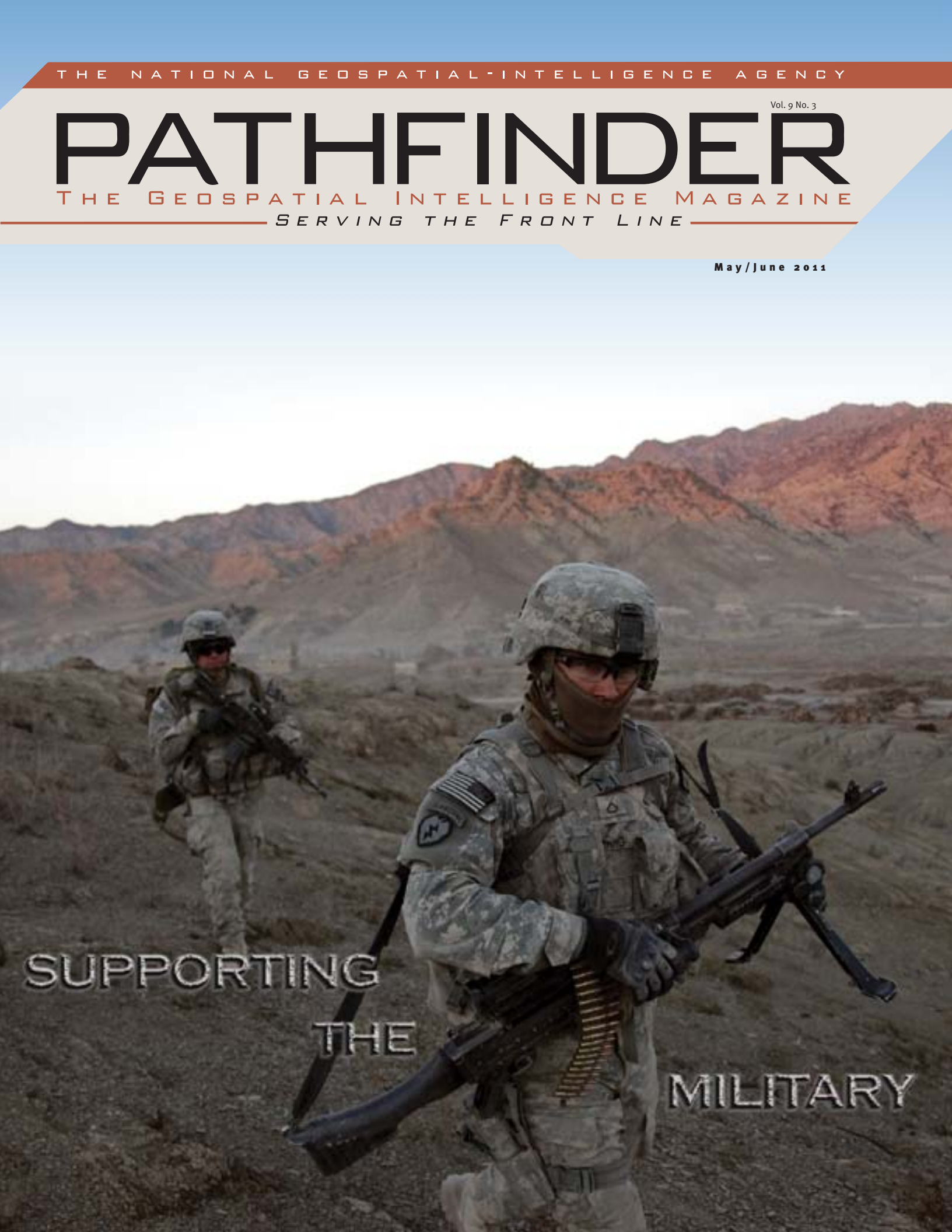
Vol. 9 No. 3

PATHFINDER

THE GEOSPATIAL INTELLIGENCE MAGAZINE

SERVING THE FRONT LINE

May/June 2011

A photograph of two soldiers in a desert environment. The soldier in the foreground is wearing a camouflage uniform, a helmet, and a balaclava, holding an M4-style rifle. The soldier in the background is also in full combat gear, holding a rifle. The terrain is arid with reddish-brown hills in the background.

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ON MY MIND

Putting the Power of GEOINT in the Warfighter's Hands

As a combat support agency in the Department of Defense, the National Geospatial-Intelligence Agency plays a critical role in providing geospatial intelligence in support of military operations. We apply a broad range of expertise—cartography, regional analysis, imagery and geospatial analysis, geodesy and geophysics, imagery science, aeronautical analysis and others—to aid in the planning and conduct of combat operations and other military operations.

How do we do this? One of the keys to our success is understanding the needs of our military partners through our NGA support teams at the combatant commands and military service intelligence centers and by embedding analysts in the operational footprint to provide the tailored support for their mission. One example of this, described in the article on supporting the African continent, is the geospatial support team embedded with the Combined Joint Task Force-Horn of Africa.

We also provide a geospatial foundation upon which vast amounts of data can be correlated, leading to analytic assessments that help identify trends and predict what may happen, as illustrated by NGA's partnership with Army civil affairs. In addition, we place great emphasis on ensuring we continually develop our expertise and tradecraft, broadening the geospatial intelligence discipline to its full potential and ensuring the National Geospatial-Intelligence College provides training that moves us to the next level.

Army Maj. Gen. Michael T. Flynn, former chief military intelligence officer for the International Security Assistance Force in Afghanistan, gave us his perspective from his time in theater when he spoke to the NGA work force in January. He congratulated us and said that we were “doing exactly what needs to be done.” But he didn't stop there. Taking a look at the future, he posed a question to the audience, the same question that led to a report that he coauthored analyzing the effectiveness of our intelligence operations in Afghanistan: How are we going to “continue to grow, to evolve...continue to change with the times we are facing?”

How is NGA going to take advantage of the technology, like smart phones and GPS, which our adversaries use to such powerful effect? How are we going to use that technology to better serve the warfighter?

The NGA vision, “Putting the Power of GEOINT in Your Hands,” seeks to provide some answers. For example, by providing online, on-demand GEOINT, we can help an intelligence officer at U.S. Central Command push reliable, actionable intelligence to the soldier in the field more quickly. Broadening and deepening our analysis will ramp up the quality of that intelligence by providing additional context.

We are committed to putting the best, most comprehensive and most accurate GEOINT resources in the hands of those who carry out the warfighting mission, both now and in the future, and our vision will take us to the next level in honoring that commitment.

This edition of the Pathfinder will help illuminate how the NGA work force—whether at NGA facilities, embedded with the combatant commands, military service centers or other agencies, or those who are forward deployed in direct support of operations working beside our military members—plays a critical role in helping our military achieve mission success.

LETITIA A. LONG
Director

CONTENTS

- 2 On My Mind
- 5 NGA in the News
- » FEATURES
- 6 Implementing the Vision—NGA Poised to Strengthen Relationship With In-Q-Tel
- 8 Burial at Sea Charts—A Unique NGA Service
- 10 NGA and Army Civil Affairs—A Natural Evolution of Fused Civil Intelligence
- 12 Supporting the African Continent with GEOINT
- 14 Army GEOINT: Engineering and Intelligence Communities Join Together
- 16 The Ground Truth—Putting the Power of GEOINT in the Hands of the Warfighter
- 18 The Freedom of Information Act and You
- 20 NGA Leads the Way in Its Commitment to Work Force
- » DEPARTMENTS
- 22 Our Heritage: Remembering Vietnam 2: Early Days in Laos and Vietnam

ON THE COVER

The National Geospatial-Intelligence Agency is both a member of the Intelligence Community and a Department of Defense Combat Support Agency. As part of DOD, NGA provides geospatial intelligence to the military worldwide, supporting both warfighter and civil affairs missions. *Cover design by Ron Kee; DOD photo. Back cover, Wikimedia Photo*



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Nathaniel Bowditch GEOINT Research Center Opens at NCE

» The National Geospatial-Intelligence Agency GEOINT Research Center recently began a new chapter in its history with relocation of large portions of its staff and collection from Washington, D.C., and Bethesda, Md., to the NGA Campus East in Springfield, Va.

According to Nancy B., Deputy Branch Chief of the Data Services Branch-East, the newly renamed Nathaniel Bowditch GEOINT Research Center “honors Nathaniel Bowditch for his important contributions to maritime navigation, mathematics and his landmark book, *The American Practical Navigator*.”

The new center is a 32,400 square-foot, modern and inviting workspace modeled after a university library. It provides comprehensive research services and access to open source and GEOINT materials to the Department of Defense and Intelligence Communities. Its collection includes almost 40,000 books; 3,000 atlases and gazetteers; hundreds of audio books, DVDs and foreign language materials; magazines and journals; 2 million ground photos; daily newspapers; and over 800,000 maps out of a total 1.2 million in the collection.

In addition to its physical holdings, the center offers digital products and services and plans to digitize its entire map collection of over 600,000 unique items by September 2011.

The St. Louis Research Center provides similar physical holdings and research services at its 2nd Street location for employees in the West.



NGA Photo by Rob Cox

Sharon R. Parish

Leadership, Outstanding Women Awards Honor Sharon Parish

A National Geospatial-Intelligence Agency senior leader who was killed in a car accident is being honored with the creation of a Department of Defense leadership award and renaming of an NGA award.

The Sharon R. Parish "People Always" Leadership Award was created to "encourage and promote leadership qualities she exemplified," according to a recent statement. The award is designed to recognize leaders at all levels with the Department of Defense acquisition and contracting communities. Award winners must have developed, motivated and inspired others through formal and informal initiatives.

The DOD award is open to military or government employees within the DOD acquisition/contracting communities at any grade level. The person selected for that award will be recognized at a banquet scheduled for May 11 at the DOD Procurement Conference and Training Symposium in Orlando, Fla.

NGA has renamed its "Outstanding Women of NGA Award" to the "Sharon R. Parish Outstanding Women of NGA Award" in honor of Parish. The NGA award recognizes women who have advanced the NGA mission through their leadership, organizational and community involvement, educational accomplishments and service to others. NGA will announce this year's awardees in May.

Parish, who was Deputy Director of Acquisition, died in a vehicle accident Feb. 9. She began her career in 1971 and spent most of her time working in contracting. For seven years, she served as the senior procurement executive and director of contracts at NGA. She was a champion of personal interaction and mentoring at all levels.

Pathfinder Staff Solicits Reader Feedback

We want to hear from you! Please give us your views regarding the Pathfinder's content, format and frequency of publication. Interested readers can find a brief, 11-question online survey at <https://www.surveymonkey.com/s/TXDR7SV> through May 31. Survey responses are anonymous and will help determine the magazine's future.

Anyone who reads Pathfinder can take the survey; results will be available upon request to pathfinder@nga.mil.

NCE North Building Opens, College Relocates

The National Geospatial-Intelligence Agency marked its latest East campus milestone with the first work force deployments to the agency's north building in April.

"Although NGA Campus East has been built in record time, completing construction with its final touches will continue for some time," said Tom Bukoski, Assistant Program Manager for Design and Construction in NGA's Campus East Program Management Office.

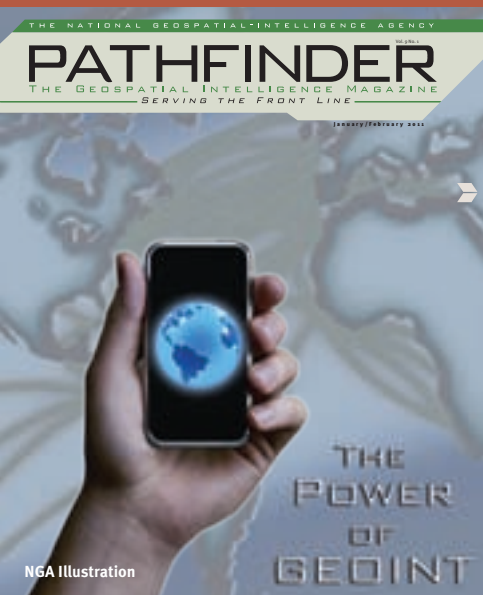
"The U.S. Army Corps of Engineers and NGA work very closely and cooperatively with the Fort Belvoir fire chief, fire marshal and garrison staff to ensure that NCE is safe, complies with all of the fire codes and can safely move its work force," said Bukoski.

The National Geospatial-Intelligence College, composed of the School of Geospatial-Intelligence and the James R. Clapper Jr. School of Leadership and Professional Development, formerly located at Ft. Belvoir's south campus, also relocated to NCE's north building in April.

Agency employees began moving into the south building, one of the campus' two main buildings at Fort Belvoir's North Area in Springfield, Va., in mid-January. NGA is midway through its move to its new headquarters, which will be completed in September 2011. The consolidation of the agency's facilities in the Washington, D.C., metropolitan area to a single location is a result of 2005 Base Realignment and Closure requirements.



NGA Photo by Larry Franklin



NGA Illustration

Implementing the Vision—NGA Poised to Strengthen Relationship With In-Q-Tel

BY REISHIA KELSEY, PUBLIC AFFAIRS OFFICER, OFFICE OF CORPORATE COMMUNICATIONS

In order to achieve the National Geospatial-Intelligence Agency's vision of taking GEOINT to the next level, Letitia A. Long, Director of NGA, pledged to make a more substantial investment in In-Q-Tel.

Launched in 1999 as a private, independent organization, In-Q-Tel's mission is to identify and partner with commercial companies developing innovative technology solutions that serve the national security interests of the United States.

"To help with the implementation of our vision, we need In-Q-Tel," said Long. "I believe in the In-Q-Tel model; it has brought us Keyhole (Google Earth), Perceptive Pixel and iMove, among other innovations, and we need and want the solutions

In-Q-Tel can broker to help us realize our vision of 'Putting the Power of GEOINT in Your Hands.'"

In November, Long defined the two main parts of NGA's vision: providing online, on-demand access to GEOINT knowledge and broadening and deepening NGA's analytic expertise.

"We need to change our business processes and our business model toward being a service provider and broker of GEOINT and a purveyor of our understanding of the world," said Long. "To that end, I intend to make the changes that are necessary to take GEOINT to the next level and to keep NGA relevant and competitive in an ever-changing world."

Since 2003, In-Q-Tel has received more than \$17



MotionDSP enables users to increase the value of video collected and acquired from a variety of sources.

million in funding from NGA. On average, for every \$1 NGA spends, In-Q-Tel leverages \$37 dollars from the venture capital community and the larger U.S. Intelligence Community, ultimately providing NGA more technology innovation for its investment.

In-Q-Tel invested in Keyhole on behalf of NGA to share geospatial data easily and accurately among its trusted customers, more specifically to support the conflict in Iraq in 2003. Today, Keyhole, and its successor Google Earth, has become the standard for portrayal of Web-based geospatial data for NGA, the U.S. Intelligence Community and the Department of Defense infrastructure.

“Our goal is to tap into emerging technologies that are already in development and leverage that innovation to meet the needs of our IC partners,” said Christopher Darby, president and CEO of In-Q-Tel. “Our partnership with NGA ensures that we have greater insight to their specific technology challenges—resulting in mission-critical solutions.”

To date, In-Q-Tel has made 39 total technology

investments on behalf of NGA of which 11 technology capabilities have been deployed, and 30 have been or currently are being operationally tested as pilots.

“In-Q-Tel has helped us effectively and efficiently access leading-edge technology for new and improved capabilities,” said David K. White, NGA liaison with In-Q-Tel.

In-Q-Tel’s core functions are to:

- » Tap into “ready soon” commercial technologies for innovation
- » Serve as a “translator” between private sector startups and the U.S. Intelligence Community
- » Focus on “adoptions and technology impact” versus financial returns

“Working together, we can take the next step toward helping our customers use GEOINT to ‘Know the Earth . . . Show the Way and Understand the World,’” said Long. 

NGA investments through In-Q-Tel:

Adapx: Faster field intelligence capture with Capturx® digital pens. www.adapx.com
Digital Reasoning: Complex large-scale unstructured data analytics. www.digitalreasoning.com
GeolQ (formerly FortiusOne): Rich, dynamic visual intelligence. www.geoiq.com
GATR: Inflatable, deployable satellite communications systems. www.gatr.com
Geosemble: Solution for integrating location-based content. www.geosemble.com
iMove: Immersive visual solutions for mission-critical security and geospatial surveillance. www.imoveinc.com
KZO Innovations: Interactive video platform. www.kzoinnovations.com
MotionDSP: Unrivaled video enhancement software. www.motiondsp.com
Perceptive Pixel: Advanced multi-touch displays. www.perceptivepixel.com
Pixim: Advanced image capture sensors and capabilities. www.pixim.com
Signal Innovations Group: Video analytics and event detection technology. www.siginnovations.com
SitScape: Creates dynamic dashboard mashups without programming. www.sitscape.com
Teradici: Transmission of quality graphics and multimedia on virtual desktop. www.teradici.com
TerraGo Technologies: Geospatial collaboration (mobile PDF) software. www.terragotech.com
VSee: Real-time video communication and application sharing. www.vsee.com



Burial at Sea Charts—A Unique NGA Service

BY SANDRA F., SUPERVISORY GEOINT ANALYST, AND LESLIE K., ENTERPRISE OPERATIONS DIRECTORATE CORPORATE COMMUNICATOR

Burial at sea is an age-old tradition for sailors;

in 1996 the National Geospatial-Intelligence Agency began honoring this tradition by using NGA-distinctive talents: technology and data.

In partnership with the U.S. Navy, NGA provides a unique version of its hydrographic maps of the coastlines and oceans: burial at sea charts. The charts mark the location of the deceased service member's burial at sea and include information about the ship providing the service and the deceased's service record. The charts provide a one-of-a-kind memorial for families.

“Families have always praised the charts; many have them framed and placed on the wall with the deceased's picture and the shadow box with the burial flag,” said Robert Cullingford, Burial at Sea Coordinator for the Mid-Atlantic Region Naval Medical Center, Portsmouth, Va.

“The charts NGA provides are a great contribution to the Navy's

Burial at Sea program and assist the families with closure in their time of loss,” added Cullingford. The charts are presented to the families of those who select burial at sea for their funeral arrangements and meet one of the following criteria:

- » Honorably discharged veterans;
- » U.S. civilian Marine personnel of Military Sea-lift Command; or
- » Citizens the Chief of Naval Operations determines eligible by virtue of notable service or other contributions

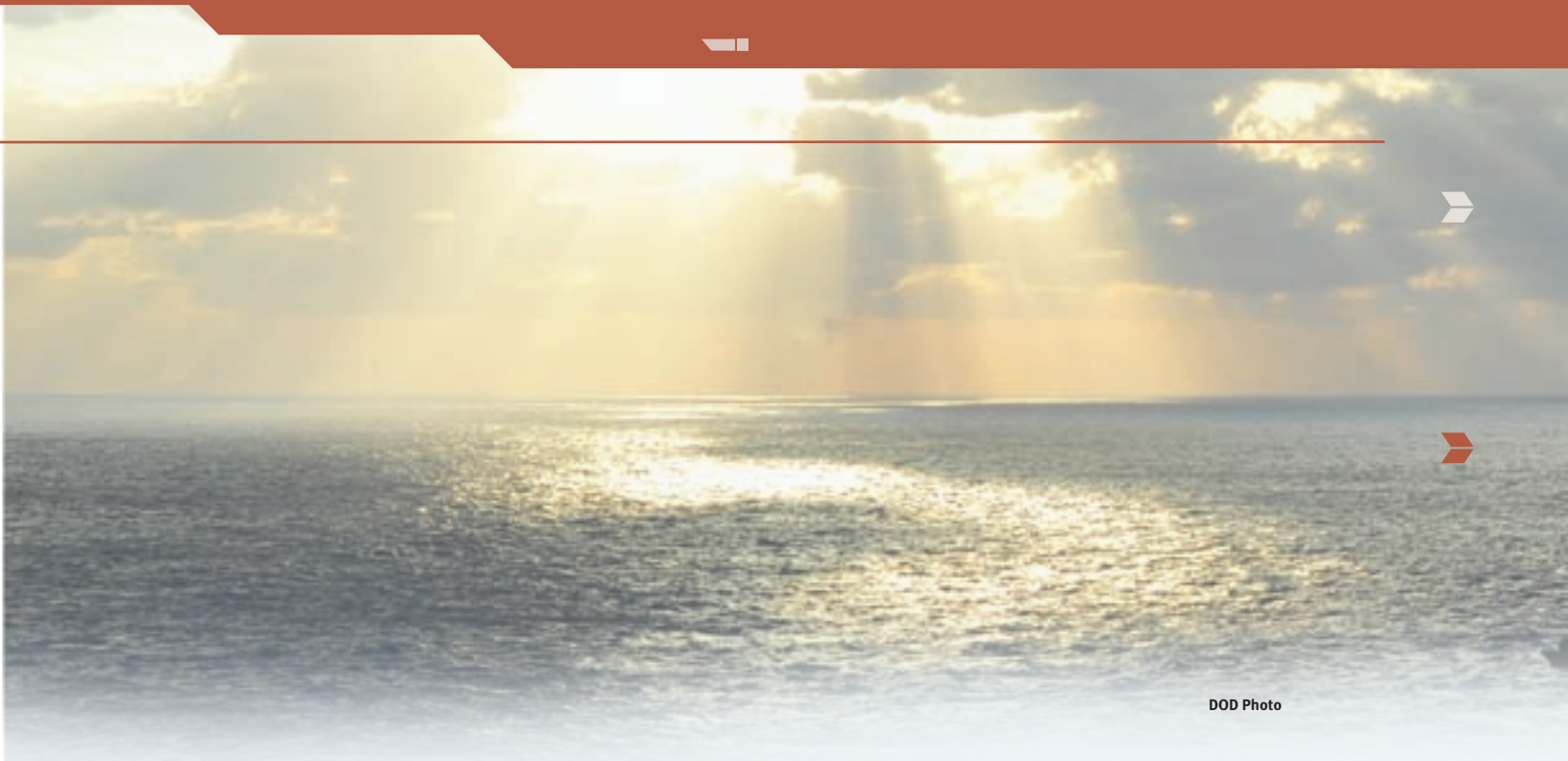


Burial at sea charts mark the location of the deceased service member's burial at sea and include information about the ship providing the service and the deceased's service record.

Fictitious chart provided for illustration purposes only

According to the Remote Replication Service analyst at MacDill Air Force Base, Tampa, Fla., the Navy was introduced to RRS capabilities in 1996 when they first became available. Capabilities included scanning, enhancing and reducing full-size hydrographic charts, as well as customization and printing. Previously available technology required an hour to load and scan one large-format hydrographic chart on huge tangent drum scanners. Adobe PhotoShop® software was used to enhance the product, and 3M Scotchprint® graphic software was used to reduce the size during printing on the old electrostatic printers. Analysts manually added information about the deceased, along with Navy and ship seals, after printing.

Today a library of digital hydrographic charts and ship seals from various vessels, as well as high-end geographic information workstations and plotters, have further streamlined the creation of these charts as compared to earlier practices.



DOD Photo

Navy personnel perform the burial at sea ceremony during deployments. The captain slows the ship to minimum speed at a select location, and the officer of the deck calls all hands to bury the deceased. The flag is lowered to half-mast, and the crew stands at parade rest in preparation for the service. The honor guard drapes the coffin with the American flag and carries it to a stand on deck.

The ceremony includes military and religious portions based on the deceased's request. After the ceremony, the firing party presents arms, and the burial party removes the flag from the coffin as it slides gently into the ocean. For cremated remains, the burial party places an urn in the sea or scatters the ashes in the wind. The firing party then fires three volleys, and the bugler plays taps. The ceremony ends with the folding of the flag, and the ship resumes course. The Navy informs family members of the time and location of the burial and provides photos of the ceremony.

NGA receives requests for Burial at Sea Charts for approximately 40-50 deceased personnel per month between the two RRS sites at Norfolk Naval Base, Norfolk, Va., and Hickam Air Force Base, Honolulu, Hawaii. After receiving the burial coordinates from the ship's commanding officer, RRS analysts in Norfolk and Honolulu note the location on the chart and mark it with a picture of the American flag or a red cross. They add the time

and date of the burial, the name of the deceased, his or her service and rank, and the Navy and ship seals in the margin of the chart. The RSS analyst provides prints and mails up to three copies of the chart to the Naval Ministry Group for delivery to the families.

Eligible personnel who would like to request burial at sea should indicate so in a will or other legal document. The executor or executrix of their estate will need that written documentation as well as the following:

- (1) a photocopy of the death certificate;
- (2) the burial transit permit or the cremation certificate; and
- (3) a copy of the DD Form 214 military discharge certificate or retirement order.

The executor or executrix of the estate can contact the Navy-Marine Corps Mortuary Affairs Office at (866) 787-0081 during funeral planning. Additional information can be found at the Navy Personnel Command casualty assistance Web site, at: <http://www.persnet.navy.mil/Command-Support/CasualtyAssistance/MortuaryServices/Burial+At+Sea.htm>. **P**

NGA and Army Civil Affairs—A Natural Evolution of Fused Civil Intelligence

BY ANDREW R., STAFF OFFICER, ARMY NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY SUPPORT TEAM

A National Geospatial-Intelligence Agency-Army civil affairs partnership in an operational environment is a natural and necessary evolution of the intelligence process and the capabilities of each entity.

For months the U.S. Army had searched for a certain high-value target within a Baghdad neighborhood. They had no description, no known residence and absolutely no starting point to begin the search.

During this timeframe, the HVT walked into a local business, threatened the manager and demanded protection money. He left his cell phone number so he could be contacted when the extortion money was ready. Because of ongoing business efforts in the community by U.S. Army civil affairs units, the manager called the local CA unit when the HVT walked out of his office. Within

30 days the HVT was in custody.

Although CA units are not traditionally active intelligence collectors, the information they collect and the local relationships they develop result in civil intelligence that can be essential in assisting the maneuver commander in operating and saving lives.

One of the lessons learned from the Iraq and Afghanistan wars is that conflict-changing information, the “winds of change,” moves up from the baker, rug weaver, goat herder or even the regular everyday unemployed citizen standing on the street corner. The winds of change—be they for better or worse—might not be felt as even a slight breeze inside the Washington, D.C., beltway or a corps headquarters, but on the street, at ground zero, they might be an irreversible gale force wind.

Operating daily and performing civil military operations in the middle of those hurricane-strength winds of change are CA soldiers.



Soldiers of the 353rd Civil Affairs Command discuss business operations with local mechanics at a garage near Baghdad.

Photo by Army Sgt. Eddie Torres, 353rd Civil Affairs Command

The CA mission is defined as “the interaction of military forces with the civilian populace to facilitate military operations and consolidate operational objectives.” The mission allows these military forces constant contact with the local population to include community and business leaders within their own environment, far from the intimidating pressures of a U.S. base camp. Breaking it down even further, these soldiers assist local populations with reestablishing basic needs and services, local government structure, a functioning economy and educational opportunity.

Throughout U.S. history, these soldiers have been on the ground working hand-in-hand with the civilian population. Though few in number (approximately 8,000, with 96 percent of them reservists), this force brings its civilian expertise to the battlefield and serves as a force multiplier to the active component units to which they are assigned.

When your ranks are composed of and relied on to provide the expertise of a banker, police officer, teacher or doctor, it is difficult to be recognized as a warfighter; your mission is to assist, advise and eventually rebuild while the overall role of the U.S. Army is to destroy the enemy. This sometimes leads to confusion when CA soldiers are assigned to combat units.

Since Bosnia, CA has begun to reassert itself as a true force multiplier; CA soldiers became so critical to post-kinetic operations that the Army commissioned an active duty brigade. Today it is nearly impossible to find a reserve CA soldier who has not deployed multiple times; this creates a large pool of experience and knowledge.

On a recent deployment, CA soldiers tasked an NGA support team analyst stationed in Baghdad to search for and identify advertising billboards in Baghdad, a large and mundane task. To a CA commander, however, the ability to identify and use a billboard that may assist in influencing a neighborhood, or may promote a business or even

an individual, becomes invaluable. Such an operation that might take soldiers on the ground years to accomplish took an NGA analyst—who concurrently accomplished other daily mission requirements—less than a month.

Some independent CA brigade headquarters constantly produce civil intelligence, the fusion of political, economic and social data derived from not only the brigade teams but also subordinate CA units throughout the area of operations. Many of the reports and white papers are passed to specific medical, weapons of mass destruction, human intelligence and document exploitation offices within national agencies. Unfortunately the interaction between CA soldiers and NGA geospatial support teams is limited at best.

According to CA Intelligence Officer Army Col. Mark Calabrese, “For CA the main role of the NGA support team was route assessments, overlays, trends and predictive intelligence that CA teams were not getting elsewhere.”

NGA provided critical intelligence for CA teams, but the civil intelligence still did not make its way back to the NGA teams.

More and more NGA products in theater require this on-the-street civil intelligence data, and the reality is CA units that have this knowledge and expertise need someone to request and emphasize the importance of the information they have. The Army NST has begun to engage more actively CA and reserve soldiers on a whole. Like the NGA deployed analyst, the CA soldier is everywhere. The civil intelligence that a CA soldier possesses could very well assist in early detection of possible flash points or in identifying the winds of change prior to their getting out of control, ultimately saving lives. **P**

Editor's note: Andrew R. deployed as an Army reservist and intelligence officer for the 304th Civil Affairs Brigade.



Supporting the African Continent with GEOINT

BY RICH M., GEOSPATIAL ANALYST

The National Geospatial-Intelligence Agency plays a vital role in providing geospatial support to the military's humanitarian efforts on the African continent.

The Department of Defense established the Combined Joint Task Force–Horn of Africa in 2002 to provide regional security and stability in the East Africa region. Camp Lemonnier, Djibouti, is the headquarters of CJTF-HOA and has become an important military installation for the United States and its mission partners in East Africa. CJTF-HOA's early missions were proactive and focused on counterterrorism activities.

Initial objectives were to disrupt rogue organizations and deny safe haven to terrorist activity.

In 2008 Camp Lemonnier was U.S. Africa Command's first military installation on the continent. The U.S. Navy operates this former French Foreign Legion military barracks and supports a diverse range of U.S. and coalition military missions. The primary mission of CJTF-HOA matured into building stable relationships with partner nations and securing strategic objectives. Long-term regional stability is now achieved through civil-military operations, humanitarian and medical assistance projects and military-to-military operations.

Task force activities include building schools, clinics and hospitals and drilling wells.

NGA's geospatial support team at Camp Lemonnier enables that mission, providing image-based and geospatial products, including maps and analysis for operations in the HOA area of responsibility. The area of responsibility includes forward-deployed bases throughout the African theater and the U.S. embassies in Djibouti, Ethiopia and Kenya and U.S. Army civil affairs, U.S. Navy construction and Sudan referendum activities.

The U.S. Army Reserve 418th Civil Affairs Battalion from Belton, Mo., was the first civil affairs battalion to arrive in the HOA. According to team leader U.S. Army Maj. Michael Guiles, the battalion actively engaged in opportunistic activities to improve the harsh living conditions of the

Djiboutian people. His team's main focus was to improve the schools and public infrastructure of Djibouti City. The team identified domestic projects beneficial to the local community, such as drilling wells, upgrading medical facilities and renovating schools and public infrastructure. Guiles coordinated priorities with local and regional political leaders to strengthen the overall stability of the Djibouti government.

"Image maps are a problem solver in this type of work," said Guiles. "Without them, effective communication would be difficult. We come from a different culture and speak a different language, but we understand their issues and concerns when the maps get rolled out."

Establishing trust and personal friendships with the village elders was a high priority for the CA soldiers. NGA-produced commercial image maps of a village conferred prestige upon a village and the elders who received them.

The Seabees, the U.S. Navy's civil engineers, are well-known for conducting operations in hostile environments. Their task is to execute military and civilian critical infrastructure construction projects for the CJTF-HOA mission. Critical infrastructure includes the assets essential for the functioning of a society and economy. The Seabees' humanitarian-focused missions include construction and maintenance of schools, medical facilities and communication centers. Teams are assigned sectors along the coastal region. Initial missions were for the reconnaissance of the lines of communication required to plan logistics activities necessary for supplying the projects with material and resources.

The Seabees often operate in unfamiliar terrain and require geospatial support not normally available to them in remote locations. Often, these reconnaissance missions require an extensive use of civilian thematic maps. Fortunately, the NGA GST's inventory of digital geospatial products quickly met their needs. NGA analysts provided thematic maps of geology, soil, vegetation, slope and population



NGA Photo by James S.

An NGA geospatial support team member, at right, reviews maps provided to military members of the Camp Lemonnier, Djibouti, contracting office. The office's regional desk officers process and manage all contracts for projects throughout the Combined Joint Task Force-Horn of Africa area.

density and a littoral analysis of the Kenyan coastline. The analysis indicated few beaching areas and numerous navigational hazards and obstacles for watercraft. After the Seabees completed their reconnaissance missions, the Global Positioning System data was collected, processed and provided in hard-and softcopy format for the next phase of their mission planning.

In January 2011, the Sudan referendum became the task force's main priority. Several staff sections (including intelligence, operations, logistics, air operations and civil-military operations) provided their critical information requirements for NGA analysts to produce a planning map that consolidated their specified themes into a common operational picture. Obsolete or unavailable feature layers hindered initial data collection. However, data mining on United Nations-affiliated Web sites provided the most current data layers for the expected refugee crises.

Key to the success of this product was the constant interaction between the customer and the analyst as new or updated data were added

to the feature list. For example, initial transportation infrastructure was obtained from standard NGA data holdings. Later, this data was replaced with very detailed and well-attributed supply route data collected by U.N. sources from previous crises in the country. The map provided a current situational awareness of logistics issues and transferred the corporate knowledge of the infrastructure, terrain and refugee population to a much larger customer base.

NGA personnel are an integral part of the task force supporting the AFRICOM mission. The customer base is broad and diverse, and each day brings unforeseen challenges and new experiences. GST personnel discover the task force's mission is an invigorating and rewarding experience as they continue to get the right information to the right people at the right time.

Providing direct geospatial support to civil affairs, civil infrastructure and humanitarian missions demonstrates NGA's commitment to working closely with its military partners. **P**

Army GEOINT: Engineering and Intelligence Communities Join Together

BY ARMY LT. COL. JASON STRICKLAND, MILITARY EXECUTIVE, ARMY GEOINT OFFICE

What's happening with U.S. Army geospatial intelligence? The engineering and intelligence communities are together at last. While some are skeptical, many professionals are celebrating the long overdue union of these two disciplines.

Regardless of perspective, accomplishments and advancements made in the Army GEOINT enterprise in the past year are numerous and tangible.

Last fall the Army formally redesignated its operational imagery intelligence battalion from the 3rd Military Intelligence Center to the Army GEOINT Battalion. This organizational move officially recognized the emerging mission of this unique command as a GEOINT producer and an official contributor to unified GEOINT operations. What the battalion now holds as a new name also reflects the mission it executes on a daily basis.

"Delegating GEOINT production responsibility baseline target analysis to the Army GEOINT Battalion allows us to align more with the newly developed Southern Command joint intelligence staff unified government operations directive," said Ezell Powell, Integrated GEOINT Division Chief at the 470th Military Intelligence Brigade.

The battalion now has more than just military and civilian imagery analysts; a civilian geospatial analyst and a military geospatial engineer now work alongside their imagery intelligence partners. Additionally, efforts are under way to include additional GEOINT disciplines within the battalion. Through the foundry program, and in collaboration with the National Geospatial-Intelli-

gence College, the battalion's GEOINT Sustainment Training Facility provides an adaptable, relevant curriculum for soldiers heading to theater. It ensures proficiency in the most recent and applicable GEOINT methodologies.

Next, the Army is in the process of institutionalizing GEOINT cells from brigade combat teams to Army service component commands, integrating imagery intelligence and geospatial engineering disciplines. The GEOINT cell will synchronize unique and complementary capabilities to meet the needs of the commanders at each echelon without a manning increase. This structural change, along with GEOINT support teams at deployed locations and NGA support teams at stateside Army garrisons, gives tactical commanders a multifaceted approach to leverage all aspects of the National System for Geospatial Intelligence. Meanwhile, the Army and NGA are reviewing the line of demarcation to determine how to best complement the capabilities of each organization.

Efforts are also under way for geospatial engineers and imagery analysts to train together at the U.S. Army Intelligence Center of Excellence at Fort Huachuca, Ariz., by replicating a GEOINT cell in a training environment. The Joint Intelligence Combat Training Center conducts live environmental and situational training exercises to challenge soldiers to find creative solutions to intelligence problems. With the assistance of the NST at Fort Huachuca, the center drafts scenarios that mirror the complexities and environment of the current battlefield.



Many more initiatives in the Army demonstrate the progress of GEOINT. These include:

- » Publication of Training Circular 2-22.7, Geospatial Intelligence Handbook;
- » The merger of enlisted imagery analysts and common ground station operators into one military occupational specialty; and
- » The materialization of integrated GEOINT divisions at military intelligence brigades around the globe and at the Army Space and Missile Defense Command/Army Forces Strategic Command.

While this marriage of GEOINT in the Army is moving forward, there are still initiatives that must be addressed to maintain momentum. Two specific topics are areas for further development.

The first is the creation of a service GEOINT element to integrate GEOINT-related activities and military service functions among the Army, NGA and the National System for Geospatial Intelligence.

With the second, the Army is exploring training and education opportunities for field grade officers within the NSG. In addition to the required five-week training course at Fort Huachuca, greater immersion in national-level GEOINT will provide necessary exposure to our future Army leaders. This initiative is currently being introduced to the NSG through the Community GEOINT Training Council.

The marriage of geospatial engineering and imagery analysis within the Army is long overdue; the developing model will hopefully lead to future GEOINT successes within the enterprise. **P**



An Army imagery analyst (in uniform) works on an imagery work station during Exercise Empire Challenge, an annual intelligence, surveillance and reconnaissance demonstration led by U.S. Joint Forces Command at Ft. Huachuca, Ariz.

Photo by Army Sgt. Catherine Long



The Ground Truth—Putting the Power of GEOINT in the Hands of the Warfighter

BY ARMY CAPT. EDWARD MAJOR, EXECUTIVE OFFICER, DIRECTOR OF MILITARY SUPPORT STAFF

Editor's note: Following is an opinion piece based on the author's experience as a deployed military engineer.

Simply put, the “where” is what ties everything together. Geospatial intelligence helps provide the all-important context and depth to other intelligence disciplines. Only when fused together is the power of imagery intelligence, signals intelligence and human intelligence fully revealed. Among the emergent capabilities to bring the intelligence disciplines together is GEOINT.

Warfighters are dependent on the geospatial depiction of fused intelligence and need a single, comprehensive system to bring it together below the brigade level.

I saw the power of GEOINT firsthand on my deployments to Iraq and Afghanistan. My unit, the 4th Engineer Battalion, conducted route clearance operations—finding deadly improvised explosive devices before they found us. We operated in Baghdad, Iraq, in 2009 and across Regional Command–South in Afghanistan in 2009 and 2010. Because of our size and dispersal, our battalion intelligence section was unable to help everyone all of the time. Because virtually all deployed analysts work at brigade level or above, there is a resulting scarcity of GEOINT the closer one gets to the fight. However, warfighters below the brigade level need GEOINT capabilities as well.

Thanks to newly available GEOINT tools such as the Tactical Ground Reporting Network, Combined Information Data Network Exchange, GeoQuest and Google Earth, I analyzed, customized and personalized the intelligence I used with my platoon. With them we prepared for the threats we faced, such as IEDs. We more efficiently searched for our enemy and targeted specific areas. The tools also gave us a limited ability to connect with other people working in our area and share impressions and trends in our enemies' behavior.

Leveraging these capabilities, however, was far more difficult than was necessary. First, these tools are painfully slow; most required an application

download every time we accessed them. Second, redundant reporting plagued the systems. This skewed searches for activity and wasted time. Third, incomplete information was plentiful, but comprehensive and useful information was not. Fourth, some of the best information was poorly or not at all captured because of difficulties in inputting data into the systems. These important losses meant that the fusion could not share the pieces that would most help others on the system. Fifth, these parallel systems communicate minimally and cannot be searched in tandem. Moreover, because of the lack of interoperability, units often declare one system the unit's official system and post updates on one at the expense of the others. Finally, I lacked the understanding of other tools I could leverage to give my unit a better picture of the battlefield. All these difficulties together turned a great idea into several splintered and cumbersome systems that failed to measure up.

As incredible as the capabilities of GEOINT are, they are currently neither meeting the needs of the end user nor living up to their potential. Deployed analysts from the National Geospatial-Intelligence Agency do amazing work with units but cannot be everywhere. No one system fully meets the needs of junior combat leaders. The tools are out there, but there is palpable disappointment in the ability to get that fused intelligence down to the lowest levels. We can neither afford unnecessary redundancy nor support programs that do not fulfill their intended purpose. A single system must assume the work and purpose that these disparate and duplicative programs currently occupy. Otherwise, we run the risk of losing all the value added in GEOINT-fueled intelligence fusion in the hands of the end users.

Enter the National System for Geospatial Intelligence, which manages GEOINT in all forms from cradle to grave. As the NSG's functional manager,

NGA must bring the NSG together to cull the ineffective, disparate systems and promote a single, unified program that will better meet the GEOINT needs of our users. The future of GEOINT lies in giving people access to do their own work in an online community environment. This community must allow users to tailor their products to their own needs and to connect and share work and ideas with similarly interested individuals.

Fortunately, a program that puts the ability to analyze and customize at the lowest level is already in line with NGA's goals. Unveiled at the GEOINT Symposium in 2010, NGA's vision is to "Put the Power of GEOINT in Your Hands." By placing our focus on getting analytical abilities down to the end users, small unit leaders will be able to give their units a better appreciation of the battlefield without the in-depth training analysts undergo.

Tools that put GEOINT into the hands of the user are one way to improve that support. Three things stand out about such a course of action. First, it has the capacity to increase the pool of experts who participate in intelligence operations at a low cost to NGA and bring together these specialists to broaden and deepen our collective expertise. Second, implementing such a system will actually increase the intelligence that makes it into the hands of end users because it makes more and better intelligence available to more people. Lastly, with proper system design, training and equipping, we may be able to scale back our forward commitment to some of our deployed operations. This direct, personal support was superior service, but with limited resources, we may not always be able to support everyone who needs it. However, with a better designed system that connects GEOINT to the end user, NGA may be able to mitigate some of those gaps.

A great deal of thought must be put into our intelligence fusion system in order to learn from the mistakes of the past and effectively engage users.

To be effective, this tool must have the following characteristics:

- » Be able to upload, download and edit layers of data to and from a central cloud architecture
- » Allow the display of terrain and data from multiple viewing angles
- » Include an intuitive user interface tailored to warfighters
- » Be a program that remains on users' computers or handheld device without having to download prior to each use
- » Standardize templated data entry to facilitate better indexing
- » Allow the ability to connect with other users working in the same field or geographic area
- » Incorporate a search engine that can display data graphically and textually at the same time
- » Define an active data manager who ensures accuracy of the system's data
- » Provide mobile access to soldiers in the field from handheld devices

Pushing the ability to use GEOINT to the end user is an eminently worthy ideal. This may mean letting some projects go and endorsing a new tool that some may see as a threat. Even with the benefits that a replacement promises—a better, unified GEOINT-based intelligence fusion system that replaces several stove-piped, inadequate systems—it may be difficult to bring everyone onto the same page. That is why NGA must fulfill its chartered leadership role as functional manager of the NSG. If it uses its influence responsibly, NGA can be a catalyst to bring everyone in the right direction. If not, we fail our users by arming them with a confusing array of systems that cannot do what they need. Success will look like keeping the warfighter one step ahead of our enemies, and putting the power of GEOINT in their hands is a step in that direction. **P**

The Freedom of Information Act and You

BY HELEN CHAPMAN, FOIA PROGRAM MANAGER

We've all seen them—documents from the federal government shown on television with parts redacted. The viewer wonders what the government is hiding behind those blacked-out portions.

What does the requester seek in a Freedom of Information Act request? Is he or she looking for information on UFOs or additional information on Watergate? Maybe the requester is looking for images from World War II.

Whatever the topic, the documents in question were probably located because of a FOIA request. While some requests are controversial, most are not.

As NGA is a Department of Defense Agency, the NGA FOIA Program Office works closely with the DOD Freedom of Information Policy Office and DOD sister agencies. In fiscal year 2010, the NGA FOIA Program Office processed over 300 FOIA requests.

“We have noticed a steady increase in the number of FOIA requests we receive each year,” said Cynthia Ryan, General Counsel for NGA. “We believe that this increase is inevitable and a good thing. The more the public learns about the mission of NGA, the more questions they will have for us. NGA is committed to providing as much information as it can to the public while protecting the information that necessarily must be withheld. It is a balancing act between the public’s right to know and the protection of national security.”

The Freedom of Information Act grants U.S. citizens, foreign nationals, libraries, universities and the media, among others, the right to request records from the government. The United States was the third nation, after Sweden and Finland, to implement such a law.

Beginning in 1955, the media, working with Rep. John Moss of California, led efforts to have Congress pass a Freedom of Information Act. After much negotiation and over the objections of many federal agencies and departments, President Lyndon B. Johnson signed the act into law on July 4, 1966.

As Johnson said at the time, “This legislation springs from one of our most essential principles. A democracy works best when the people have all the information that the security of the nation permits.”

Successive administrations have expanded the role of FOIA, most recently in the Open Government Act of 2007 and President Barack Obama’s memorandum to heads of the executive departments and agencies, dated Jan. 21, 2009.

In his memorandum Obama stated, “In our democracy, the Freedom of Information Act (FOIA), which encourages accountability through transparency, is the most prominent expression of a profound national commitment to ensuring an open government. ...the Freedom of Information Act should be administered with a clear presumption: in the face of doubt, openness prevails.”

The attorney general and the U.S. Department of Justice have oversight of the FOIA program. According to the DOJ Web site, in fiscal year 2009, over 500,000 new FOIA requests were submitted to the federal government, with the Department of Homeland Security and the Social Security Administration receiving the most requests in their respective categories.

In FY 2009 the government spent over \$382 million on FOIA. Agencies recoup approximately 3 percent of the cost of FOIA through fees charged to the requesters.

How to File a FOIA Request

Several government agencies provide excellent resources to assist in filing FOIA requests: the Department of Justice (www.justice.gov); the State Department (www.state.gov); the Department of Defense (www.defense.gov) and the National Archives and Records Administration (www.archives.gov). Also, every agency has on its Web site the process and contact persons for filing a FOIA request with that specific agency.

With the vast amount of information now on the Internet, it is recommended that you do as much research as you can prior to filing your

FOIA request. An often overlooked, but excellent, resource for information is an agency's reading room, also located on an agency's Web site. Once you determine that a FOIA request is your best avenue to obtain the information you seek, go to the agency's Web site and follow its guidance for submission of your FOIA request.

The FOIA office will need to know your requester category in order to properly assess fees. An estimate of fees can be provided before they undertake the search, and you can state a limit up front on what amount you are willing to pay. The fee categories are:

- » Commercial - Willing to pay all fees for search, review and duplication.
- » Educational, non-commercial scientific and news media - The first 100 pages are provided free of charge. Agencies may waive fees if they determine the request is in the public interest.
- » Other - All requesters who do not fit in the above categories are considered "other;" most are seeking information for their own use. The "other" category receives two hours' search, all review costs and the first 100 pages of duplication free of charge. The public normally falls into this category.

FOIA Exemptions

Sometimes the information must be withheld from release under strict guidelines using the following FOIA exemptions (5 U.S.C. § 552) as summarized in the "DOD Freedom of Information Handbook":

- (b)(1) – Records are currently and properly classified in the interest of national security
- (b)(2) – Records related to internal personnel rules and practices
- (b)(3) – Records protected by another law that specifically exempts the information from public release
- (b)(4) – Trade secrets and commercial or financial information obtained from a private source that would cause substantial competitive harm to the source if disclosed (proprietary)

(b)(5) – Internal records that are deliberative in nature and part of internal decision making process that contain opinions and recommendations

(b)(6) – Records that if released would result in a clearly unwarranted invasion of privacy

(b)(7) – Investigatory records or information compiled for law enforcement purposes

(b)(8) – Records for the use of any agency responsible for the regulation or supervision of financial institutions

(b)(9) – Records containing geological and geophysical information (including maps) concerning wells.

NGA exemptions usually fall within categories (b)(1), (2), (3), (4) and (6).

Right of Appeal

If an agency denies your request, you have the right to appeal the decision. Appeals should be in writing and sent by the requester to the agency's address stated in the denial letter. Appeals must be received within 60 calendar days from the date of the denial letter.

Summary

The Freedom of Information Act was enacted to allow us to access the information that the United States government has, and within certain constraints, the information will be provided. Take the time to research the FOIA sites throughout the various agencies. See what they have to say and if need be, request information. It is your right.

For further information, contact the NGA FOIA Program Office at (571) 557-2987 



NGA Leads the Way in Its Commitment to Work Force

BY LAURA LUNDIN, PUBLIC AFFAIRS OFFICER, OFFICE OF CORPORATE COMMUNICATIONS

The National Geospatial-Intelligence Agency

has dedicated a full-time senior executive to help increase the diversity and equality of its work force and advocate for NGA's employees. As the only member of the Intelligence Community to follow this model, NGA has seen positive improvements in the diversity—and commitment to diversity—of its work force as a result.

Created in 2007, the equality executive position focuses on three core areas: 1) advocate and advance equality and diversity 2) assess and address work force concerns and 3) provide executive leadership and communication at all levels of the agency.

"My main role is to look at diversity and equality at NGA on behalf of the director, as well as to make sure the work force understands that we are committed to the idea of diversity and equality from a leadership perspective," said Fred Faithful, NGA's equality executive.

"I also try to keep my finger on the pulse of the work force," Faithful said. "I exist to help the employees of NGA work through the system if they need help, and I also make sure we as an agency react to the more long-term strategic initiatives—like career development—that have a significant impact on our mission readiness."

By interacting with the NGA work force either on an individual basis or in small groups, Faithful seeks to understand the work force's needs and, as a result, help improve inefficiencies by advocating for policy and procedure changes on their behalf.

In 2006, NGA stood up the Office of Diversity Management and Equality Employment Opportunity based on an independent study that recommended the agency move its diversity and equality functionality out of the agency's Human Development Directorate.

What was lacking, according to NGA leadership, was a focus on diversity and the very specific Equal Employment Opportunity mandates the law requires. "By pulling the function out of the Human



NGA Photo by Rob Cox

Members of the Defense Privacy and Civil Liberties Program Office brief Equality Executive Fred Faithful (at far left). The office implements the Department of Defense Privacy and Civil Liberties Program through advice, monitoring, official reporting and training.

Development Directorate, NGA was able to focus more on the diversity piece," Faithful said.

The equality executive position was then tasked to oversee the integration of certain HD and ODE functions, ensuring those functions focused on people and reinforced the agency's commitment to diversity and equality.

"Having the senior position of equality executive has provided significant advantages for NGA employees," said Karen Mullet, deputy director of NGA's Human Development Directorate. "The equality executive has been an invaluable partner in building awareness about NGA's commitment to the professional and personnel success of our work force."

"Overall, the NGA work force is more diverse today than three to four years ago," said Allene Mikrut, director of diversity outreach and training. "By the end of fiscal year 2009, NGA had increased its representation of minorities and women."

NGA leads the IC in representation of African American employees, with 13.1 percent compared

to 11.6 percent across the IC, and in the representation of people with disabilities, with 7.1 percent compared to 5.7 percent across the IC.

“We still have much work to do, especially in attracting more minorities and women to both our current and future work force,” Mikrut said.

While these statistics show the positive results of NGA’s commitment to its people, Faithful looks to his other role as key to NGA’s success as an agency. “It is the position’s broader focus on people, which I really take seriously,” Faithful said. As a result, Faithful has taken on several initiatives aimed at improving the professional environment for NGA’s work force.

“Our agency is leading the way in action planning by really attempting to understand what the work force has said through the Employee Climate Survey,” Faithful said. “We sort through some of the issues that the work force raises—all from an agency level and with a more holistic approach.”

Another significant initiative was the equality executive’s involvement in preparing for the agency’s move to NGA Campus East, under way and scheduled to be completed by September 2011. In the design of the new campus, NGA really looked at how a facility could foster the culture needed for 2011. It was important for NGA not only to create a better place for its employees but also a more efficient place for NGA operations in support of the GEOINT mission, fostering a culture that would increase collaboration not only within the agency but across the IC.

A cross-agency team met to define the cultural attributes important to NGA’s future. The result was the culture integration and implementation plan, which guided the design of the physical space and created the basis for NGA transition. NGA leadership authorized the plan in 2007; it had very specific recommendations on how to transition to a 2011 culture.

According to the plan, NGA needed to reinforce cultural changes like increasing collaboration with

mission partners and NGA team members alike. The plan also focused on other cultural characteristics like developing a more fun and friendly work environment, creating a learning and teaching environment, developing professional trust and demonstrating more accountability both from a leadership and work force perspective.

An additional focus developed from that initiative—the NGA core values of excellence, accountability, respect, teamwork and honesty, otherwise known as E.A.R.T.H.

“When it comes to the culture and core values initiatives, my most dedicated and passionate support has come from the work force,” Faithful said.

Faithful and the employees involved in these initiatives “help everyone at NGA understand the basic values the agency has—the benchmarks we are looking for in our employees—to help make the agency more efficient and help us succeed in our mission,” Faithful said.

The agency has seen real progress in the areas of team work and excellence, but “we still have work to do in the areas of accountability and respect,” added Faithful.

To better develop accountability and respect among the NGA work force, Faithful established a core values action group comprising NGA team members mandated to recommend how to instill these core values in the NGA culture.

By giving NGA employees a champion for work force issues, NGA leadership demonstrated they value the tremendous talent of NGA’s employees and are committed to maintaining a firm foundation on which the work force can grow and prosper professionally.

The creation of the Office of the Equality Executive demonstrates the agency’s pledge to its people, who in turn have dedicated themselves to the GEOINT mission in support of the warfighter, its mission partners, foreign allies and U.S. policymakers. **P**

OUR HERITAGE

REMEMBERING VIETNAM 2: EARLY DAYS IN LAOS AND VIETNAM

DR. GARY E. WEIR, CHIEF HISTORIAN

On the 50th anniversary of the first direct American military involvement Vietnam, the Department of Defense has called upon our country to remember with respect and gratitude those who served in Southeast Asia. This series of six articles—of which this is the second—will illuminate the significant role played in Southeast Asia by people in the tradecraft communities that now comprise NGA.

At the behest of President John F. Kennedy, in the spring of 1961 the U.S. Air Force sought to continue the Eisenhower administration's assistance to Royal Laotian forces against the Pathet Lao and the North Vietnamese. As a pilot qualified in both the RF-101C reconnaissance aircraft and the RT-33 reconnaissance aircraft, Fred Muesegaes of the 45th Tactical Reconnaissance Squadron found himself speaking with his commanding officer about a highly classified activity called Project Field Goal. As it turned out, Muesegaes seemed the logical choice. Of the four pilots in the 45th TRS so qualified, he alone had yet to marry. He doubted that the project had anything to do with friendly territory.

Along with Robert Caudry of the 15th TRS, Muesegaes went through a series of intelligence and political briefings on Laos and the current military conditions in the country. In the process, he and

Caudry successfully challenged suggestions to sanitize the operation by removing any American markings from them or the aircraft. They did not care to become part of the CIA's complement of operational aircraft in Southeast Asia, Air America. They also found the briefings on local culture given by a missionary expelled from the target region a bit unsettling; they had no plans to visit the local villages.

While the briefings occurred at Clark Air Force Base in the Philippines, Field Goal would take place from Udorn Royal Thai Air Base because of its proximity to Laos. The RT-33 in question would carry a 12-inch nose-mounted oblique camera, six-inch right and left oblique cameras, with one six-inch vertical. The support team, along with Muesegaes, flew to Udorn from Clark in a C-130 transport aircraft, while Caudry flew the RT-33. Destined to become one of the busiest air bases in the Southeast Asia conflict, in early 1961 Udorn had a 7,500-foot runway, a large shed and a Marine air base battalion living in tents.

Support at the air base proved minimal, and takeoff usually took place in a cloud of dust. For their part, Muesegaes and Caudry accomplished their flights into Laos by dead reckoning. They did not have nearly enough map coverage for their



intended targets, and the RT-33 had to find holes in the cloud cover to descend. Only when they came down through the clouds did they have an opportunity to determine their location. On the return leg, the air base beacon had only a 25-mile range, and upon touchdown the RT-33 had to slow rather rapidly due to the lack of an arresting gear and the presence of a large ditch at the end of the runway.

Upon landing they took the film with them to an H-34 helicopter for the trip to Vientiane, the Laotian capitol, for the first-phase review. During Field Goal the pilots themselves assisted the photo interpreters within the first phase. They would bring the film, work on the interpretation for as long as it took, and then find their way back to Udorn on any flight available. The H-34 was dedicated to the film, not to them. In one case they hoped for a return ride on the H-34, but had to wait. To their consternation, the pilot shut the aircraft down. However, when the Marine aviator climbed out of the cockpit, they saw the makeshift tourniquet and realized he had completed the flight to Vientiane after having received a bullet in his leg from ground fire.

On his first mission out of Udorn, Caudry himself took some anti-aircraft fire. He flew north to Dien Bien Phu and over the Plaine des Jarres at 20,000 feet, taking images with his vertical camera before

proceeding down Highway 13 to the intersection with Highway 7 employing the oblique cameras. At that point he observed the source of small caliber anti-aircraft fire near Vang Vieng: quad 50-caliber machine guns mounted on Dodge trucks firing way off the mark. The weapons probably came as spoils from the Pathet Lao victory over the Laotian government at the Plaine des Jarres on Jan. 1, 1961. Unfortunately, the anti-aircraft fire intensified over time and improved greatly. To make matters worse, in 1961 the Army believed it spotted the first MiG aircraft to take to the skies in that area.

In these early years, critical reconnaissance focused on roads, communication links and the movement of the enemy. Routes leading from China and Vietnam into Laos proved especially important because of the absence of detailed local maps, which the Army Map Service began to address.

Field Goal provided the United States and the Laotian government with a great deal of valuable intelligence data and some excellent first-and second-phase interpretation. As the 1960s progressed, the work became more intense, the stakes higher, and the photography and interpretation even more professional. **P**



RT-33 reconnaissance aircraft

Lockheed Martin photo

COMMEMORATING
THE 50TH
ANNIVERSARY OF THE VIETNAM WAR



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