

THE NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Vol. 5 No. 5

# PATHFINDER

THE GEOSPATIAL INTELLIGENCE MAGAZINE  
SERVING THE FRONT LINE

SEPTEMBER/OCTOBER 2007



NGA — THEN AND NOW  
BY VICE ADM. MURRETT



NGA MOVES AHEAD IN 12  
FOCUS AREAS

Taking the  
**Right  
Path**





ON MY MIND

## Focus Areas Guide NGA's Strategic Direction

For the last several years, a climate of stability and continuity at NGA has allowed all of us to concentrate on our mission and move out on the vital and dynamic support that we provide for the nation and our allies. Based on last year's transition with retired Lt. Gen. James Clapper, now Undersecretary of Defense for Intelligence, NGA's Executive Leadership identified a list of enduring focus areas that would serve as the Agency's framework for tackling challenges, advancing our role in the defense and intelligence communities, and strengthening the geospatial intelligence (GEOINT) discipline. Inevitably, our Agency will face many challenges, and NGA's 12 Focus Areas will assist with our strategic direction over the next several years. This edition of the Pathfinder provides further insight into the 12 Focus Areas and discusses activity taking place under each. I am very proud of the work NGA has done to advance these 12 Focus Areas. Our progress to date has been impressive and, based on your efforts, will continue for the foreseeable future.

### Partnerships and Multisource Analysis Are Key

Our nation and our allies continue to face rapidly evolving threats. In order to confront and defeat those threats, NGA, along with its Intelligence Community (IC), Department of Defense (DoD) and international partners, is advocating a culture of collaboration and integration. Three of our key Focus Areas are based on developing new ways of looking outward, expanding partnerships and strengthening our multisource analysis capabilities to better counter the threats of today and prepare for the future. Additionally, we are looking to use new sources and methods for gathering GEOINT data, including open-source information and imaging technology using the entire electromagnetic spectrum. By recognizing the growing needs of our mission partners and through our governance of the National System for Geospatial Intelligence, we continue to boost the acquisition of cutting-edge technologies for our workforce that will provide computer-assisted query and search tools, as well as real-time coordination and rapid-response capabilities.

### Workforce Can Expect Facility Enhancements

Through our Focus Areas, NGA continues to improve its internal programs, business processes and governance structure to best meet the needs of our people. NGA's leadership training, career development and award programs are top-notch and are viewed as best practices by the IC and DoD. We continue to improve and enhance our facilities and, over the next four years, will deploy our east mission to a new site in Springfield, Va. This change will affect every member of our workforce, and we are taking the necessary steps to ensure a smooth transition to our new, state-of-the-art facility. We will also continue to improve our facilities in St. Louis.

### GEOINT Mission Will Continue to Expand

We as an Agency, a community and a nation must remain agile and adaptable to change. Threats to our nation will continue to evolve. New technologies will continue to be developed. The demands for GEOINT across the nation and with our allies will continue to grow. The NGA footprint and partnership with the IC will continue to expand. We must embrace these changes and position our resources to meet new challenges head-on. I am proud of the accomplishments NGA has made over the past year. The dedicated, talented and highly trained men and women of NGA remain steadfast in their commitment to the GEOINT mission, the mission sets of our partner organizations and the preservation of our national security. As we make progress against our Focus Areas, we will continue to strengthen the GEOINT tradecraft, expand our international and domestic partnerships, develop our workforce, upgrade our facilities and enhance our ability to provide timely, accurate and relevant GEOINT when and where it is needed most.

*Robert B. Murrett*  
ROBERT B. MURRETT  
Vice Admiral, USN  
Director







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### ON THE COVER

Instructors train students to use the Global Positioning System (GPS) during an intensive 14-week advanced geodetic survey course at NGA's School of Geospatial-Intelligence, part of the National Geospatial-Intelligence College at Fort Belvoir, Va. Members of this class include military personnel from the United States and coalition partners from the Czech Republic, South-Korea and Taiwan. Taking the right path may require accurate GPS readings, made possible in part by NGA data. More than ever, it may also involve collaboration, based on the need to share geospatial intelligence quickly in response to threats, both natural and manmade. NGA has 12 Focus Areas to ensure it stays on the right path. This issue looks at the progress made and challenges ahead. Photo by Tony Boone.



## LETTER TO OUR READERS

### Taking the Right Path

As NGA completes its yearlong decennial celebration, our Director, Vice Adm. Robert B. Murrett, takes a comprehensive look at what we've accomplished. NGA has responded to unprecedented threats to our nation, created a whole new discipline—geospatial intelligence (GEOINT)—and much more, he notes in "Then and Now, Celebrating 10 Years of GEOINT."

After looking back with pride at how far we've come, the Director also brings us to the present and where we intend to go in the future. That direction was made clear in the 12 Focus Areas NGA's executive leaders established as the Agency embarked on its second decade. Now, it's time to ask the question, "Are we on the right path?" And so the Pathfinder asked experts representing the 12 Focus Areas to recount their milestones and discuss the challenges ahead.

To keep up the momentum and share the excitement, I encourage you to give these 12 Focus Area reports a close look. Together, they should give you the feeling that great strides are being taken across NGA. You will also see that the whole is greater than the sum of its parts, as progress in each Focus Area moves the whole Agency forward.

My desire for our friends outside of NGA is that this annual report will give you a better understanding of NGA's many contributions and potential. For NGA readers, I hope it will give you insight into the accomplishments of colleagues outside your area and some of the challenges they face. Perhaps you will be motivated to collaborate even more and expand the impact of GEOINT across our broad mission set.

Focus Area 1—"Look outward and be the most collaborative partner with the Intelligence Community (IC) and warfighter"—has received renewed emphasis. Soon after his appointment, Director of National Intelligence Mike McConnell called for a different mindset within the IC, from "need to know" or even "need to share" to "responsibility to provide." That spirit is captured by a recent deployer, who commented about how his job has changed. Before, he said, "We weren't looking to resolve an issue, solve a problem or answer specific requests. We were just looking to make a product." He continued: "I couldn't have even imagined doing what I did on my last deployment, where my only goal was to get the customers what they needed. The best part of being a deployer was seeing the impact my analysis had on our warfighters." Regardless of our where we sit in the Agency, we all need to capture that spirit and let it influence everything we do.



PAUL R. WEISE

Director, Office of Corporate Relations

# PATHFINDER

Published by the National Geospatial-Intelligence Agency  
Office of Corporate Relations  
Strategic Communications Branch (OCRNS)  
4600 Sangamore Road, Mail Stop D-54  
Bethesda, Maryland 20816-5003  
Telephone: (301) 227-7388,  
DSN 287-7388, or  
In St. Louis: (314) 263-4142,  
DSN 693-4142  
E-mail: pathfinder@nga.mil

#### DIRECTOR

Vice Adm. Robert B. Murrett

#### OFFICE OF CORPORATE RELATIONS, DIRECTOR

Paul Weise

#### DEPUTY DIRECTOR

Art Haubold

#### STRATEGIC COMMUNICATIONS BRANCH, CHIEF

Louis Brune

#### EDITOR

Paul Hurlburt

#### MANAGING EDITOR

Jennifer Harris

#### VISUAL COMMUNICATIONS DIVISION, CHIEF

Richard Hardwick

#### GRAPHIC DESIGNER

Carmella Bender

#### CONTRIBUTING AUTHORS

Frank Calabrese

Anita Davis

Craig Donovan

Richard Fravel

Gary W. Fuller

Juanita Hartbarger

Vonna Weir Heaton

Danielle Henderson

David C. Hill

Jeff J. Leonard

Allene (Lainey) Mikrut

Ernie Moore

Lynne Mueller

Vice Adm. Robert B. Murrett

Kathleen Neary

Dr. Eileen M. Preisser

Gene Reich

Cynthia R. Ryan

Betsy K. Scrivener

Mark Shelberg

Dr. Gary E. Weir

#### GETTING PUBLISHED

All members of the geospatial intelligence community are welcome to submit articles of community-wide interest. Articles are edited for style, content and length. The copy deadline is the last Friday of the third month before publication. For details on submitting articles, send an e-mail to pathfinder@nga.mil.

The *Pathfinder* is the medium with which the National Geospatial-Intelligence Agency enhances and promotes public awareness and understanding of the discipline of geospatial intelligence. The *Pathfinder* is an authorized Department of Defense publication for members of the Department of Defense. Contents of this publication are not necessarily the official view of, or endorsed by, the U.S. government, Department of Defense or NGA. Articles in the *Pathfinder* may be reproduced in whole or in part without permission, unless stated otherwise. If they are reproduced, please credit the author and the "National Geospatial-Intelligence Agency, the *Pathfinder* magazine." Any reproduction of graphics, photographs and imagery is subject to the original copyright.



UP FRONT

## Continuous Learning Gets a New Approach

BY ERNIE MOORE

In keeping with one of NGA's 12 Focus Areas, investing in our people, the Acquisition Contracts Office (AC) has started an innovative program to encourage continuous learning. Called AC Continuous Experience, Skill and Study, or ACCESS, the program taps the knowledge of senior leaders, emphasizes team learning and takes advantage of online resources, all at little or no cost.

NGA's senior procurement executive, Sharon Parish, had charged staff to determine the best method of meeting training and education needs of the workforce as a supplement to Defense Acquisition Workforce Improvement Act (DAWIA) certification. Within 90 days, the ACCESS was born.

Three characteristics of the program are essential for its success. First, ACCESS relies on the "TEAM" principle—Together Everyone Achieves More." This aspect stresses the important role each AC professional plays in knowledge

sharing and in the growth and development of their colleagues. Second, senior, more experienced employees in AC mentor, coach and share their knowledge, expertise and best practices with the less experienced staff. Finally, individual self-study of contracting and leadership competencies is encouraged and expected as a matter of routine. Collectively, these characteristics allow ACCESS to generate learning opportunities that are flexible, dynamic and just in time.

Special features of ACCESS include an easy-to-use, online tool and an ACCESS Guide and Toolkit. The online tool provides structure for the continuous learning process and allows instantaneous access to a wealth of information that is pertinent and useful throughout NGA, the Department of Defense, the federal government and beyond via the World Wide Web. ■

### ERNIE MOORE

coordinates the ACCESS program for the Acquisition Contracts Office as a contractor employee.





# NGA—Then and Now Celebrating 10 years of GEOINT

BY VICE ADMIRAL ROBERT B. MURRETT, DIRECTOR, NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

This year NGA celebrates 10 years of the geospatial intelligence (GEOINT) discipline. A decade ago, NGA's predecessor, the National Imagery and Mapping Agency (NIMA), was formed when eight different organizations and a critical mass of skills and technologies were combined. NIMA's essential experts brought together diverse capabilities to create ideas and possibilities never imagined before. This convergence laid the foundation for GEOINT and one unified mission. The creation of NGA in 2003 was an acknowledgment of this revolutionary step in both name and practice. Today NGA is the premier provider of GEOINT, supporting defense and intelligence missions worldwide and some of the nation's most difficult intelligence challenges. In addition, NGA has played a key role in support of natural disaster and humanitarian crisis response and national security defense. From NGA's discovery of ethnic cleansing atrocities in Kosovo to support for cities hosting the Olympics and response to Hurricane Katrina, NGA's 10-year anniversary has been a yearlong celebration of an incredible legacy and a rich history of support.

## NIMA: The Early Years

NIMA was formed in October 1996 when the nation's most capable imagery and geospatial assets were combined. NIMA brought together the Defense Mapping Agency, Central Imagery Office, Defense Dissemination Program Office and National Photographic Interpretation Center. This new Agency also incorporated parts of the CIA, Defense Airborne Reconnaissance Office, Defense Intelligence Agency and National Reconnaissance Office.

From 1996 to 2003, the organizations forming NIMA were learning to work together. This posed many challenges, among them learning to work with personnel and missions from eight separate organizations, each with its own history and corporate culture. NIMA, however, continued the work of its predecessors. For example, the Agency influenced world events by creating animated renditions of imagery and geospatial data that allowed users to visualize inaccessible terrain. These types of technological innovations were the hallmark of NIMA's formative years, even in the face of its greatest challenge: to consolidate diverse ideas, technologies and missions.

NIMA's first year saw unprecedented advances. As part of this, NIMA joined forces with the NASA Goddard Space Flight Center to create the Earth Gravity Model (EGM96). This revolutionary new model improved accuracy in Global Positioning System readings, satellite orbit determination and measurements collected by geodetic satellites, which meant more accurate navigation and targeting.

## NIMA: Expanding its Footprint

During the late 1990s, NIMA's footprint expanded, bringing its technologies to regions of global concern. In 1997, NIMA produced 78 imagery-derived maps covering a total of 13 million acres in support of the effort to suppress the wildfires in Indonesia. These maps not only helped the Indonesian authorities identify affected areas, but also enabled the U.S. military reserve units deployed to assist with fire suppression efforts. That same year, NIMA became the





leader of the Image Collateralization Initiative, providing operational sites to electronically distribute secret collateral satellite imagery within the Department of Defense (DoD). By eliminating higher security restrictions, NIMA was better able to develop the system needed for this kind of imagery and ensure more timely delivery of its products to those who needed them.

In 1998, NIMA brought support to the decades-old border dispute between Peru and Ecuador. The new Agency created maps and image products used in the negotiations between Peruvian President Albert K. Fujimori and Ecuadorian President Jamil Mahuad. The conflict came to a conclusion on May 14, 1999 with a ceremonial laying of a boundary stone in the disputed area of the Amazon jungle.

That same year, NIMA also provided support to Operation Desert Fox in Iraq. This conflict emerged when Baghdad was bombed by American and British forces for violating a United Nations order for inspection of weapons. NIMA's role was to create products like digital terrain data over Iraq, which was used for mission planning. The Intelligence Community (IC) came together to support the operation, with NIMA playing an essential role in increasing weapon accuracy.

In 1999, NIMA supported Operation Allied Force in Kosovo. In that conflict, NIMA personnel provided NATO-led Operation Allied Force over Kosovo with maps, navigational support, imagery-derived products and intelligence briefings. These products were used not only by the 21,000 U.S. military personnel involved in the operation, but also by military personnel from the other 19 countries comprising NATO. Additionally, NIMA developed NIMA-in-a-Box in support of U.S. armed forces. The product is a combination of hardware (a notebook computer) and software containing NIMA's imagery and geospatial information, providing on-the-spot information to deployed units. Two configurations of NIMA-in-a-Box were developed for Operation Allied Force in Kosovo.

In the late 1990s, NIMA assisted the U.S. Drug Enforcement Agency and its international partners in stopping the production and international transport of illegal drugs through the production of reports monitoring suspected international drug trafficking in multiple hemispheres.

During that same time period, NIMA supported humanitarian relief efforts in Rwanda and Uganda with quickly produced Landsat images used by United Nations relief workers to deliver aid shipments to refugee camps.

At the beginning of the new century, NIMA was exploring new frontiers through the expansion of its technologies and capabilities. The Shuttle Radar Topography Mission (SRTM), launched aboard the Shuttle Endeavour in 2000, was a joint mission between NIMA and NASA. The Space Shuttle Endeavour spent 11 days in flight and acquired elevation data over approximately 80 percent of the Earth's surface using the technique known as interferometric synthetic aperture radar. Producing this volume of quality data through cartographic means would have taken tens of thousands of extraction hours.

After nearly a decade, SRTM data continues to yield data for a variety of scientific applications in geology and geophysics, including earthquake research, volcano monitoring and hydrological modeling. Civilian applications include enhanced approach and ground safety systems for aircraft and better location of cell phone towers. Military applications include improved flight simulators and missile and weapons guidance systems.

In 2000, as part of NIMA's effort to enhance system capabilities and geospatial production tools, the National Imagery Exploitation System (NIES) replaced the Imagery Data Exploitation (IDEX II) system. The NIES included the Integrated Exploitation Capability (IEC), which provides access to both NGA and commercial imagery, all-source intelligence and tools for multi-intelligence data fusion. As part of the National System for Geospatial Intelligence (NSG), the NIES brought more accurate imagery and GEOINT to the warfighter in less time.

In support of the presidential inauguration in 2001, NIMA provided near real-time situational awareness for the first time by combining commercial maps, aerial photography and imagery in support of the military, Secret Service and FBI. In 2001, NIMA assisted U.S. agencies in charge of aiding the Ecuadorian government with the cleanup of a fuel spill affecting Ecuador's Galapagos Islands. NIMA provided a map of the concentration of the spill. The map was essential to conducting the cleanup and preventing additional damage to the unique ecosystem of these islands.

Even in light of NIMA's many successes in advancing the geospatial discipline in the first years of the new century, there was no one event that defined NIMA's history more than the Sept. 11, 2001, attacks on the World Trade Center and Pentagon. Never before had an attack of such magnitude been achieved on American soil. It was NIMA's







support following the terrorist attacks that spurred the recognition of GEOINT as an individual intelligence entity and ushered in a new era for the Agency.

### **NGA and the Emergence of GEOINT**

Two days after the Sept. 11 attacks, retired Air Force Lt. Gen. James R. Clapper Jr. took the helm as NIMA's second director and first civilian director, succeeding geospatial pioneer Army Lt. Gen. James C. King. Soon after Clapper's arrival, he began to promote products that emerged from a variety of new initiatives. This fusion of source and imagery that had emerged during Gen. King's tenure at NIMA now became known as geospatial intelligence, or GEOINT.

As Director of NGA, Clapper also assumed the role of GEOINT Functional Manager of the NSG. In this role, he quickly developed and published a series of formal communications that established a working doctrine for GEOINT. The first of these, the Geospatial Intelligence Basic Doctrine, appeared in July 2004.

The ensuing global war on terrorism and the events surrounding Sept. 11 dramatically changed the nature of NIMA's priorities and products. Recognizing that new threats could occur at any time or place, Clapper decided to make regional analytic overview more robust and embed NIMA analysts throughout the combat support and IC networks. His innovative concept of a unifying discipline and doctrine evolved into a new agency name, the National Geospatial-Intelligence Agency (NGA).

NIMA officially became NGA with the Nov. 24, 2003, signing of the fiscal 2004 Defense Authorization Act. The name change was more than just semantics. It reflected both the new product NGA was developing as well as the growing unity of the Agency's parts. GEOINT combined traditional geospatial, imagery and other resources to present digital representations of world locations and natural and manmade activities. This evolution meant that NGA could keep ever-growing masses of information up-to-date. The information or data could be quickly transmitted, easily stored and efficiently used by those in the military, civilian and national sectors.

The passage of the Homeland Security Act in 2002 clarified NIMA's role in supporting its national partners and helped strengthen the Agency's relationship with other domestic agencies. After the Sept. 11 attacks, the Agency quickly began to utilize tactics, techniques, procedures

and solutions it had long used overseas, applying them to domestic situations with congressional approval.

Some of these new tasks included surveying the World Trade Center site to aid reconstruction efforts and supporting the CIA's counterterrorism activities. NGA played a significant role in site examination and response planning for major national and international events, such as the Winter Olympics in Salt Lake City in 2002 and Turin in 2006 and the summer games in Athens in 2004. During these events, NGA provided maps and GEOINT for training and security. The same period saw more involvement in newly intensified efforts to protect the President of the United States, Vice President and other high-ranking officials and provide better security for U.S. military and other government facilities.

To provide this support, NGA utilized the same capabilities for scene visualization, situation analysis, intelligence data fusion and contingency planning that were provided to its military customers. The same technology that enabled flight simulation was now being used for walk-through and drive-through animations for special world events. Analysts collected data from a variety of sources, just as they did in support of the military. During deployments in support of security planners at national political conventions, NGA added commercially available terrain data, derived from radar, to avoid the limitations of cloud cover. Such high-resolution data has become the standard for other major, non-intelligence activities.

With the challenges, changes and events that transformed NIMA into NGA, there also emerged new tools and practices that better defined and advanced GEOINT. During Operation Allied Force in Kosovo, for example, NGA recognized the need for a deployable system that could withstand harsh terrain and environmental conditions. This new system had to move with the troops to bring more robust, timely and actionable GEOINT directly to wartime consumers. It was out of this idea that the Mobile Integrated Geospatial Intelligence System (MIGS) was born. MIGS is a mobile, fully self-sustaining suite of communications, life support and transportation equipment. It utilizes the High Mobility Multipurpose Wheeled Vehicle and includes a mounted satellite link, integrated power and server control and internal backup power. The MIGS has proven highly useful in military operations in the Near



East and during cleanup operations after Hurricane Katrina in New Orleans in 2005. In each instance, the MIGS permitted remotely accessible GEOINT exploitation and the ability to reach back to other facilities for support.

Shortly after Sept. 11, NIMA developed systematic ways of using the emerging technology for real-time airborne tracking and targeting. Just prior to the launch of the military action in Afghanistan, NIMA set up new centers at three of its main offices for exploiting airborne imagery. In mid-2002, NIMA leadership established an Airborne Analysis Cell, recognizing airborne imaging platforms as an untapped source of raw intelligence. The cell was constructed in less than four months and improved support to U.S. combat forces. An Operational Fusion Center was also established, placing geospatial and imagery analysts together in the same spaces. This union of analysts created a synergy that provided even more complete and accurate answers to forces in the field.

On Oct. 7, 2001, in swift response to the attacks of Sept. 11, NIMA's new product, GEOINT, followed American forces into Operation Enduring Freedom (OEF). When OEF began, the Taliban controlled more than 80 percent of Afghanistan and seemed poised to overwhelm their domestic opponents. By Oct. 20, U.S. and coalition forces had destroyed virtually all Taliban air defenses, and U.S. Army Special Forces detachments joined with anti-Taliban leaders to coordinate operations on multiple fronts. By mid-December, U.S. Marines had secured Kandahar Airport, and the Taliban capital was in the hands of anti-Taliban forces. Within weeks, the combined international effort reduced the Taliban and al Qaeda to isolated pockets of fighters. Seventy-eight days after the beginning of combat operations on Dec. 22, Army Gen. Tommy Franks arrived in Kabul to attend the inauguration of the Afghan interim government. By mid-March 2002, the coalition removed the Taliban from power in Afghanistan. The U.S. Transportation Command addressed all force positioning and most logistical needs in theater through the assistance of special maps, aeronautical navigation data and NIMA-supplied GEOINT products.

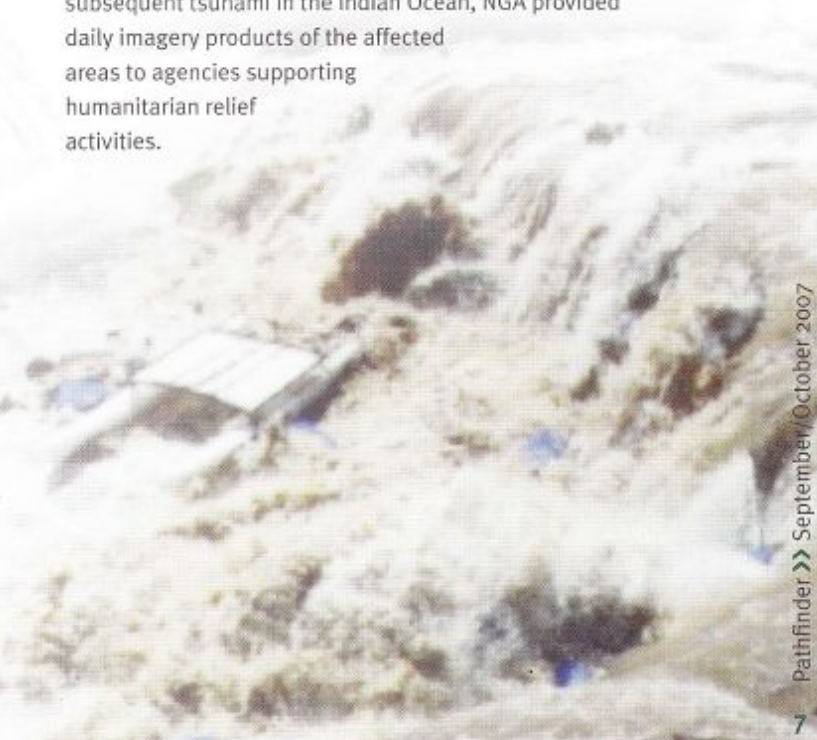
On March 19, 2003, U.S., United Kingdom and other coalition forces began conducting military operations designed to depose Saddam Hussein and identify and remove any possible weapons of mass destruction in its possession. During Operation Iraqi Freedom, imagery from reliable commercial satellites supplemented the Agency's

own assets to supply the necessary imagery in support of diplomatic initiatives, humanitarian relief and reconstruction efforts. The military and humanitarian efforts in Afghanistan and Iraq spurred the largest overseas deployment of NGA personnel in the Agency's history.

Borrowing practices used by other agencies and defense consulting firms, NGA began embedding analysts with deployed customers. The NGA deployments formed part of a concerted effort to extend the NSG into each command headquarters and national government agency. By providing support team experts at each customer site to help interpret and manipulate GEOINT products and services, NGA gave warfighters and the IC a worldwide, firsthand intelligence baseline for their own analytical and operational needs.

NGA's support to some of the most difficult defense and intelligence missions extended to its support of several significant humanitarian efforts. In 2003, following the Space Shuttle Columbia disaster that killed the seven astronauts on board, NIMA analysts worked with NASA and the Federal Emergency Management Agency (FEMA) to precisely map the likely trajectory of shuttle debris to focus search efforts more precisely. The NIMA efforts helped recover human remains and most of the dispersed debris.

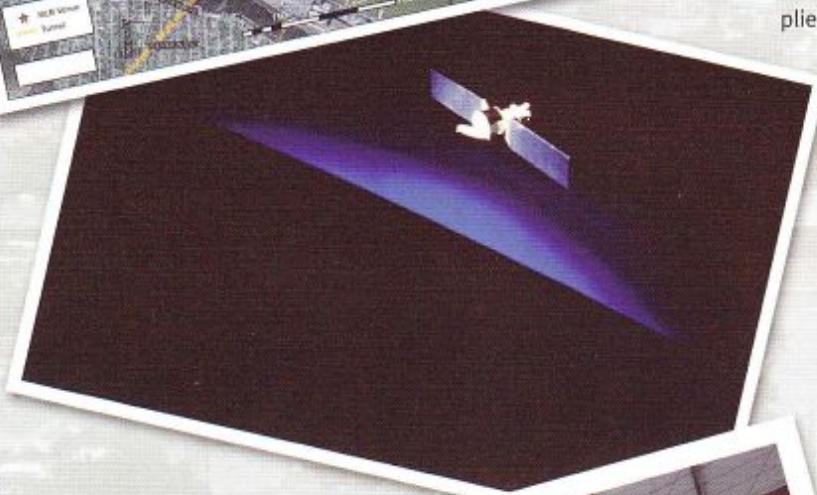
Following the Dec. 26, 2004, undersea earthquake and subsequent tsunami in the Indian Ocean, NGA provided daily imagery products of the affected areas to agencies supporting humanitarian relief activities.







These agencies included the U.S. Agency for International Development's Office of Foreign Disaster Assistance (OFDA) and the U.S. Pacific Command (PACOM). With these geospatial products, OFDA and PACOM determined priorities for emergency relief efforts and orchestrated the deployment of life-supporting supplies and personnel to the region.



The imagery products showed the scope of the damage caused by the earthquake and resulting tsunami. NGA assessed the impact on infrastructure, including damage to roads, bridges, ports and airfields, and identified how that destruction affected access to damaged areas.

In the fall of 2005, NGA was poised to provide unprecedented support for relief efforts during the most destructive hurricane season on record. Before the first waves hit the Louisiana shore on Aug. 29, 2005, NGA's assistance to Hurricane Katrina relief had begun. For first responders from the Gulf Coast counties in the hurricane's path, the Agency provided numerous graphics for relief efforts that depicted the locations of major airports, police and fire stations, emergency operations centers, hazardous

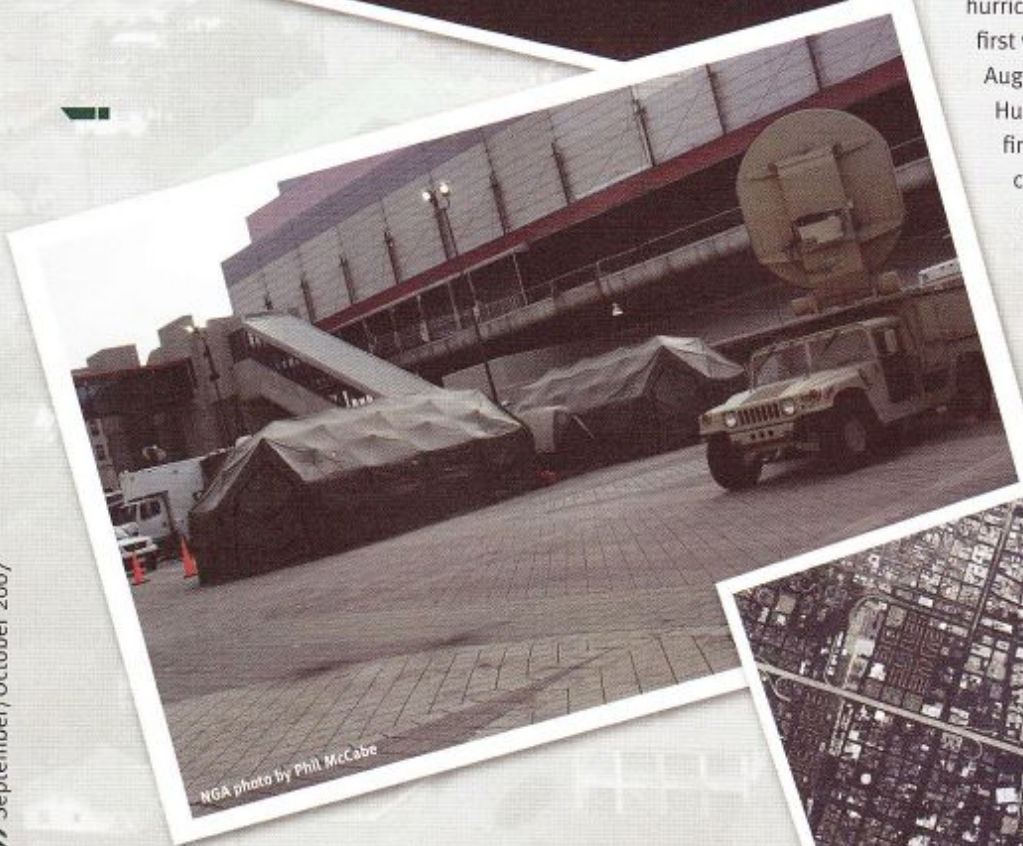


Photo courtesy of Department of the Army



materials, highways and schools. FEMA and other government agencies effectively utilized NGA information and products, which were based on imagery from commercial and U.S. government satellites and American military airborne platforms.

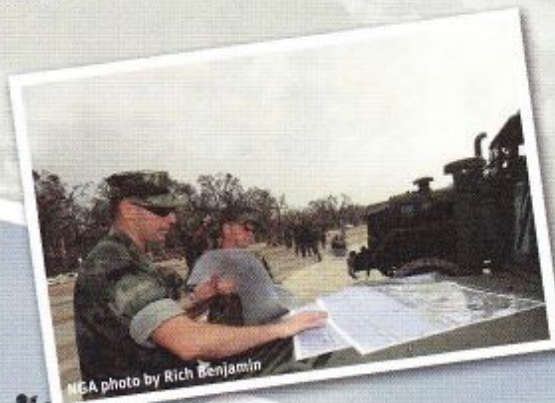
In support of both Hurricanes Katrina and Rita, NGA forward-deployed more than two dozen analysts and two MIGSs to the affected areas to provide timely, on-site support.

### **GEOINT's New Frontiers**

Over the last 10 years, GEOINT has demonstrated its unique ability to illuminate critical situations

in ways that permit relevant intelligence and military policy decisions and humanitarian response actions. Today NGA is meeting the ever-increasing need for relevant and responsive GEOINT in an era of unprecedented global change. As the Agency's priorities evolve and shift with changing times, new challenges emerge.

To ensure NGA's success in this new environment, the Agency's leaders developed 12 strategic goals. These 12 Focus Areas are designed to guide NGA's strategic direction, enable the Agency to better accomplish its objectives and align the Agency with the nation's larger intelligence and defense directives.



NGA photo by Rich Benjamin







One of the Focus Areas calls on NGA to “look outward and be the most collaborative partner with the IC and warfighter,” setting a high standard for collaboration and integration across the intelligence and defense communities. At the swearing-in ceremony for the new

Director of National Intelligence in

February this year, President Bush charged Director Mike McConnell to “better integrate” and continue to improve collaboration within the IC. Soon after, Director McConnell announced the need to move the IC beyond the “need-to-know” and “need-to-share” philosophy to a “responsibility to provide” mindset.

Recognizing that increased collaboration is key to its mission success, NGA has invested heavily in building collaboration based on three key principles: partnerships, technology and standards.

### Partnerships

NGA has a strong tradition of collaborating with colleagues across government, non-profit academia and industry arenas to exchange ideas, share best practices, display new GEOINT solutions and technologies and discuss potential tradecraft advances as they relate to GEOINT.

NGA is not the only producer of GEOINT in the government, but it is the only agency with the unique and important role as the Functional Manager for the NSG. The NSG vision is an integrated collaborative community of GEOINT professionals embedded within the Agency’s operational partners to meet their warfighting and intelligence needs. Through the NSG, NGA strives to combine technology, policies, capabilities, doctrine, archives, people, data and communities necessary to produce GEOINT in an integrated multi-intelligence, multi-domain environment.

Experience has shown that embedding personnel with mission partners is the most effective way to ensure GEOINT is accessed, understood and absorbed. Since 2003, NGA has made a concerted effort to embed personnel with IC, DoD and coalition partners through its NGA Support Teams. NGA continues to provide the precise “foundation” of knowledge about the Earth that all other

intelligence disciplines build upon. At present, NGA personnel are on the ground in about 150 locations around the world, putting GEOINT to use as part of the mission team.

NGA is also increasingly relying on international partners to move GEOINT into new arenas. Foreign partnerships enable data and analytic exchanges that enhance the effectiveness of coalition activities. These additional sources of data also improve the timeliness and cost-effectiveness of NGA’s GEOINT products. In the complex, frequently volatile world of international affairs, one constant remains: the need to deepen existing relationships and explore new ones as the globalization of GEOINT continues.

NGA’s contractual relationships with industry also remain an integral part of the overall success of the GEOINT tradecraft. In January 2003, NGA established the Industry Interaction Program to serve as the single point of contact for industry to interact with NGA. This streamlined process facilitates collaboration on topics of potential interest to NGA, with the goal to make it easier to bring ideas and products right to NGA’s doorstep. NGA will continue expanding and developing the relationship with industry to successfully manage the intelligence challenges of tomorrow.

### Technology

NGA’s mission partners have a growing need for user-friendly and responsive access to GEOINT information and services in the current online, on-demand environment. In addition to providing information on demand, NGA is moving toward a source-agnostic tasking, processing, exploitation and dissemination architecture. This means that the source of data is transparent to the end user.

Prior to 2003, NGA relied primarily on information from government satellite systems. Also, the Agency had little ability to ingest or disseminate still or motion imagery, and commercial imagery was received via hard media. Today NGA is able to exploit foreign sources and airborne still photography and full motion video feeds and can process electronic images collected through commercial imagery.

The Agency has made a significant investment to better integrate capabilities and technology with commercially available products, increase information sharing with mission partners and expand available mission support today and in the future. Commercially available products are enabling information to travel to the front lines more quickly and are better tailored to consumer needs. Prior



to NIMA/NGA, DoD and the IC were dependent on 300 IDEX workstations at 11 sites worldwide. Today, NGA has installed over 3,000 IEC high-performance exploitation workstations at over 150 sites worldwide.

NGA is working to facilitate Agency-wide transformation toward the dynamic, market-driven provisioning of geospatial data and services. By strengthening acquisition processes, NGA is better able to leverage commercially available technology and align GEOINT capabilities to changes in the operating environment. Because they are unclassified sources of geospatial data, commercial products facilitate broader information sharing with an ever-expanding number of domestic, intelligence, military and international mission partners.

For example, through an NGA partnership with industry leaders, the public has access to commercial geospatial imagery through the "public access" tab at <http://www.NGA-Earth.org>. First established in 2005 in direct response to Hurricane Katrina, NGA Earth provides current imagery to first responders, aiding in rescue and recovery efforts, while also providing unclassified views of the world in support of military and intelligence customers. In the near future, NGA Earth will deliver expanded area coverage, additional third-party data and near real-time unclassified imagery for operational planning.

### Standards

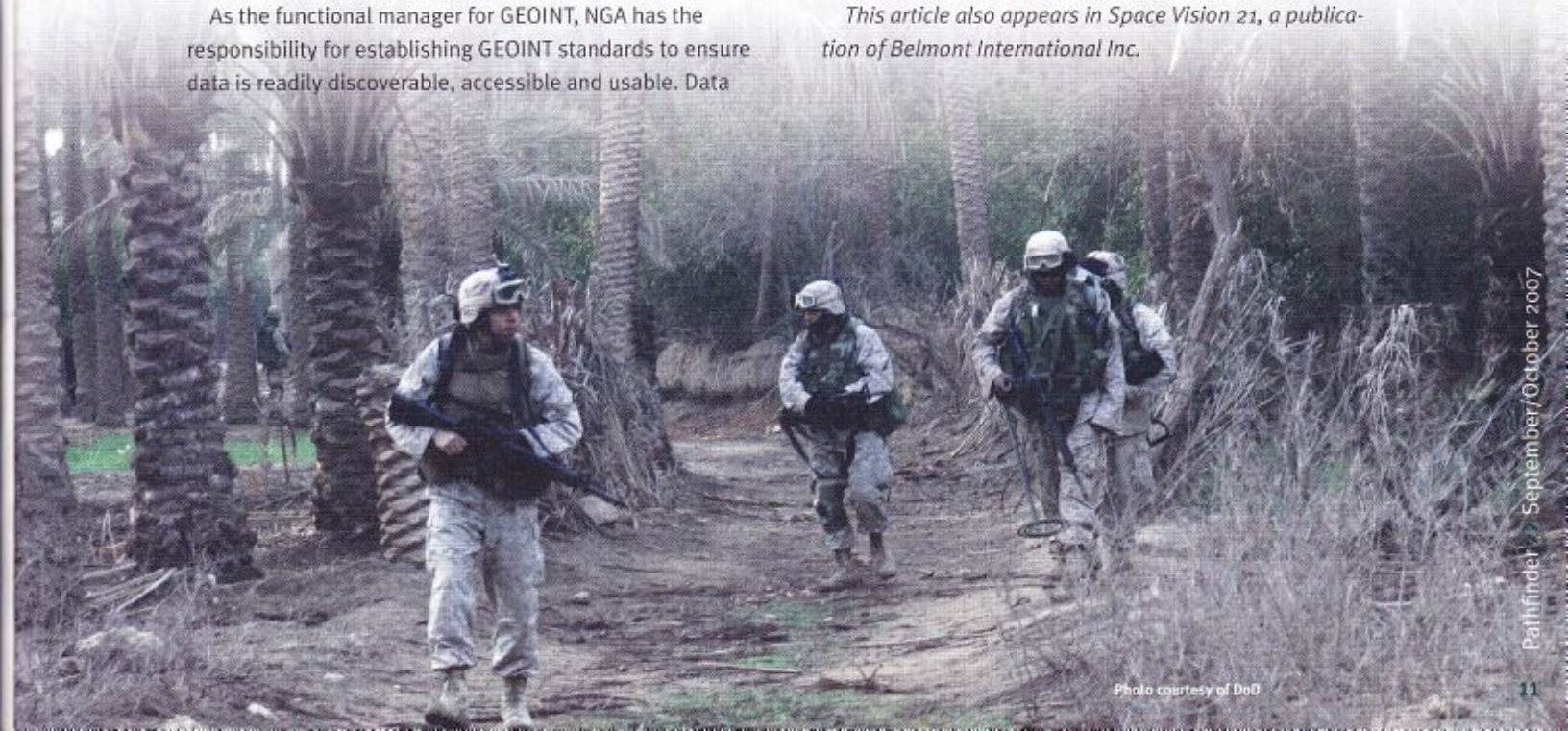
As the functional manager for GEOINT, NGA has the responsibility for establishing GEOINT standards to ensure data is readily discoverable, accessible and usable. Data

standards are critical for data sharing and collaboration and essential for Unified Geospatial Operations among NGA's mission partners. The National Center for Geospatial Intelligence Standards has engaged the GEOINT community and private sector to develop and mature a set of standards and specifications that will enable data and service interoperability in the context of a service-oriented architecture. These standards allow NGA to exploit all possible resources for data and ensure NGA can better provide the right GEOINT to the right consumer.

### More to Come

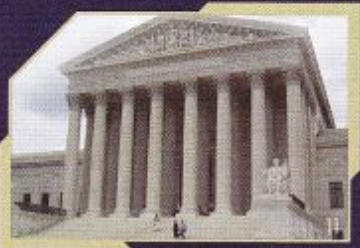
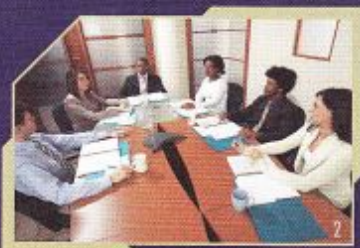
These NGA initiatives illustrate how innovative technologies, capabilities and business practices are paving the way for multi-use and cross-over GEOINT products. GEOINT's ever-increasing relevance in combat and intelligence operations, disaster relief and homeland security planning highlight the need to continue providing user-friendly, timely and robust GEOINT. As in the past, NGA will continue to adapt as new priorities emerge, evolving with the changing environment. The NSG will work to best leverage commercial products to ensure delivery of predictive and actionable GEOINT to key decision makers. The applications for GEOINT are potentially limitless, and NGA will continue to explore new frontiers in exploiting all available sources and methods for GEOINT-derived products—today and beyond. P

*This article also appears in Space Vision 21, a publication of Belmont International Inc.*





# NGA 12 FOCUS AREAS





## NGA Moves Ahead in Focus Areas, Looks to Future Challenges

Last fall the Executive Leadership Group, in a collaborative, cross-directorate effort, met to consider the key challenges facing NGA and build on the Agency's rich tradition of mission success. The executives considered ways to strengthen the geospatial intelligence (GEOINT) tradecraft, expand mission partnerships, develop the workforce and work environment, promote business transformation and foster overall mission success.

As a major outcome of their efforts, the executive leaders chose 12 Focus Areas to drive NGA's strategic direction, enable the Agency to better accomplish its objectives, and align with the nation's larger intelligence and defense objectives.

In the articles that follow, representatives of each Focus Area discuss the progress made in their Focus Area during the last year and the challenges that remain.

The Focus Areas are as follows:

- » Look outward and be the most collaborative partner with the Intelligence Community and warfighter
- » Invest in our people, with a commitment to diversity, to preserve our nation's GEOINT advantage
- » Strengthen quality of analysis in concert with other intelligence community partners
- » Develop and execute a comprehensive commercial imagery strategy

- » Integrate airborne with National Technical Means and other sources
- » Implement an information technology structure to provide access to and discovery of GEOINT
- » Advance basic research and development of leading-edge science and technology
- » Achieve front-end-back-end alignment extending from collection platforms, to building a foundation knowledge base, to providing comprehensive access to and assimilation of NGA products and services
- » Build new and enhance enduring international partnerships
- » Transform mission performance through the New Campus East and further development of our facilities in the West
- » Maintain the highest standards of conduct
- » Strengthen governance and performance management P



## FOCUS AREA 1

LOOK OUTWARD AND BE THE MOST COLLABORATIVE PARTNER WITH THE IC AND WARFIGHTER

# NGA Establishes Unified GEOINT Operations

BY FRANK CALABRESE

For NGA, collaboration is the deliberate linking of people, the processes they employ and the systems they use across the National System for Geospatial Intelligence (NSG) and the national security community. NGA recognizes the importance that collaboration plays in analyzing and reporting on crucial geospatial intelligence (GEOINT) issues and strives to be a lead partner in using this important tool. In fact, the Director of NGA has challenged the NSG community and NGA to set the collaboration standard for the broader community in a multi-intelligence (multi-INT) environment.

### Unified GEOINT Operations

Since the terrorist attacks of Sept. 11, 2001, moving from a "need to know" model to a "need to share" model in the intelligence business has become a rallying cry. Unity of effort is now the predominant theme, and that's what Unified GEOINT Operations (UGO) delivers.

A new way of thinking about the GEOINT business process, UGO is a collaborative and coordinated effort to assess, align and execute GEOINT analysis and production across the NSG and its partner organizations. UGO is based on shared responsibility and trust to optimize GEOINT capabilities in a rationally prioritized, needs-based approach to analysis and production.

UGO initiatives include the formation of collaborative communities, adoption of collaboration tools and procedures, development of an NSG analysis and production strategy, documentation of a UGO model and concept of operations, and issuance of an NSG community directory.

### Collaboration Initiatives

NGA promotes collaboration through town halls hosted by senior leaders, through small group sessions and by rewarding collaborative efforts.





With guidance and training, NGA has championed the use of emerging collaborative tools, such as wiki sites, blogs and chat rooms. It has established Communities of Practice and Communities of Interest, where teams share similar interests, tradecraft or goals. And it has appointed issue managers to ensure the integration of their functional or regional issues with other efforts both within and external to NGA. A recently created analysis cell in one physical location provides a multidisciplinary collaborative environment in which analysts can study specific issues. NGA also hosts numerous Intelligence Community forums, working groups and facility visits.

Joint duty—working in other organizations on a temporary basis—is a priority at NGA. Such collaboration allows participants to widen their perspective and cultivate cross-organizational networks, facility knowledge and information sharing. To foster collaboration, NGA has undertaken activities to acquire appropriate accesses for production analysts, expanded the number of accessible workstations and worked closely with the Office of the Director of National Intelligence on its collaborative initiatives. Collaborative activities have also included the use of seals from both collaborating agencies on products.

Challenges to the accomplishment of these activities include the efforts required in securing the appropriate hardware and software that streamlines collaboration as well as time constraints imposed on the workforce required to achieve acceptance and familiarization of new tools and procedures. The benefits will be seen in the quality of NGA's products and services.

One future goal is the development of a GEOINT Knowledge Base (GKB), a virtual repository for all GEOINT holdings and analytic support material. GKB will provide Web-based services for the discovery and dissemination of GEOINT, allowing access for analysts to engage in collaborative multi-INT analysis and product generation.

Collaboration is certainly not limited to the analytic ranks. Plans call for operators of source collection assets, with specialized knowledge of the assets they control, to work together to allocate tasking in a manner that best optimizes and synchronizes collection utility.

### The Future Is Now

Collaboration challenges the cultural mindset of retaining knowledge in a close-hold environment. It requires a paradigm shift among community analysts and leadership commitment. In summary, the keys to successful collaboration consist of a network of community expert partners, interoperable access to sources, enabling tools and information, and a culture that values, encourages and rewards outreach. P

#### FRANK CALABRESE

is a staff officer in the Analysis and Production Directorate.





## FOCUS AREA 2

INVEST IN OUR PEOPLE, WITH A COMMITMENT TO DIVERSITY, TO PRESERVE OUR NATION'S  
GEOINT ADVANTAGE

# Initiatives Promote Diverse, Multi-Skilled Workforce

BY BETSY K. SCRIVENER AND ALLENE (LAINEY) MIKRUT

**The 500 graduates of Annandale (Va.) High School** this year represented 89 nations and spoke 29 languages. The keynote speaker, news anchor Maureen Bunyan of WJLA-TV in Washington, a foreign-born black woman, told the class that she grew up in the 1960s when the world was a far different place from the one into which they were embarking. She predicted that theirs would be the generation that would elect a black president and a woman president and pass a constitutional amendment to allow a foreign-born American citizen to become president. So many dreams! All that diversity! It's not just a vision anymore.

Today's graduates are tomorrow's NGA workforce. The Human Development Directorate (HD) and Office of Diversity Management and Equal Employment Opportunity (ODE) have been charged with implementing Focus Area 2.

ODE has a number of programs under way to support a diverse and inclusive working environment to build a culture of partnership, collaboration, inclusion and respect. The office is revamping its training approach to ensure that training on diversity, equal employment opportunity, reasonable accommodation and alternative dispute resolution is integrated into all NGA training programs, including supervisory and leadership programs.

As a strategically focused organization, HD leads NGA in fostering a positive, creative culture of excellence in geospatial intelligence (GEOINT). Workforce Excellence (WE) at NGA is a corporate strategy that broadens the Agency's commitment to Focus Area 2 and documents NGA's pledge to invest in its most valuable resource, its people. (See the sidebar on Workforce Excellence (WE) at NGA.)

Recognizing a need to be proactive in developing Intelligence Community Officers (ICOs), HD has also established the Civilian Joint Duty Assignments Office (CJDA). Expertise in more than one intelligence discipline contributes to the GEOINT product. CJDA will bring together at NGA ICOs from across the community who have experience in more

than one discipline. These are the people who will become the leaders of tomorrow anywhere across the Intelligence Community (IC). NGA personnel will be available to other IC agencies and return to NGA equipped with skills and talents previously untapped.

Investing in workforce skills is critical. So, too, is fitness and good health. NGA's Advantage Fitness Program (AFP) is now permanent at NGA. The program gives employees flexibility to make physical fitness part of their lives. A regular exercise program keeps the individual mentally alert and physically fit, improves health and enhances the quality of work life and work product.

NGA continues to offer a variety of alternate work schedules, flexible work arrangements and leave options for employees to use in balancing their work and life needs.

The ultimate goal of these and other accomplishments is a diverse workforce that emulates America so that NGA can have the right people in the right place at the right time to preserve our nation's GEOINT advantage. P

### BETSY K. SCRIVENER AND ALLENE (LAINEY) MIKRUT

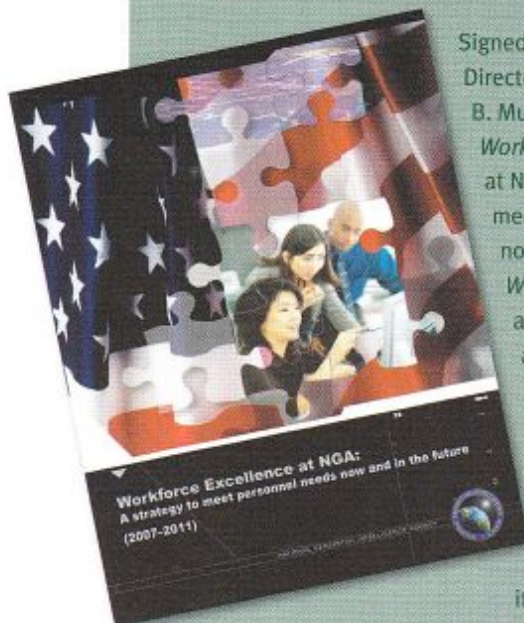
Betsy K. Scrivener supports NGA as a contractor employee.

Lainey Mikrut is Chief of the Diversity Management Division, Office of Diversity Management and Equal Employment Opportunity.



## Workforce Excellence (WE) at NGA

By KATHLEEN NEARY



Signed into effect by NGA Director Vice Adm. Robert B. Murrett last March, *Workforce Excellence (WE)* at NGA is a strategy to meet personnel needs now and in the future. *WE* at NGA lays out a course of specific actions and activities to accomplish over the next five years to strengthen and support the NGA workforce. The document derives its strategic intention

from the human capital plans of the Department of Defense and the Office of the Director of National Intelligence. The strategy reflects actions specific to NGA within the larger context of its role as a member of the defense and intelligence communities. Similarly, it supports the broader government-wide effort to further integrate the disparate elements of the communities and spur collaboration and engagement across agencies, commands and other parties.

*WE* at NGA acknowledges that meeting today's mission challenges and preparing for the future will require a technically superior NGA workforce that is more agile and empowered than ever before. The strategy provides guidance for addressing workforce challenges through a framework represented by three overarching goals.

**Goal 1: A mission-ready workforce.** The emphasis of this goal is on ensuring that the NGA workforce is aligned to the mission and fully prepared (developed and skilled). Through appropriate workforce planning, NGA can determine skill issues and meet them head on to close the gaps.

**Goal 2: A leadership corps that is engaged in and responsible for the continual development of the workforce.** Recognizing that leadership is crucial to ensuring that the workforce is equipped to perform the mission, this goal focuses on ensuring leadership responsibility. Leaders have a tremendous responsibility to leave behind a legacy of success through the development of the workforce. This goal emphasizes appropriate leadership and supervisory training, effective alignment within the organization, support tools and processes, and accountability procedures.

**Goal 3: An "NGA Employee Value Proposition" that reflects a work environment committed to individual growth and mission performance.** Goal 3 sets out to differentiate NGA from the multitude of organizations seeking a talented workforce with similar skills. In this regard, an "Employee Value Proposition" was created to encapsulate the unique and distinctive benefits of being part of the NGA team and demonstrate how NGA is an employer of choice. It's not enough to package these descriptors without ensuring they are embraced. Within this goal, measures of success will be created to engender full commitment across the Agency to deliver:

- important work in a safe and secure work environment
- performance-based compensation
- a learning environment
- a diverse and inclusive workforce
- balance between work and life.

**KATHLEEN NEARY**  
is Chief of the Strategic Workforce  
Planning Branch.





## FOCUS AREA 3

### STRENGTHEN QUALITY OF ANALYSIS IN CONCERT WITH OTHER INTELLIGENCE

#### COMMUNITY PARTNERS

## Training, Reviews and Hard Problems Scrutinized

BY DANIELLE HENDERSON

**Strengthening the quality of analysis has been a** long-standing, all-encompassing concern of national security. NGA has several initiatives under way to bolster the quality of geospatial intelligence (GEOINT) analysis in concert with other Intelligence Community (IC) partners.

#### Analyst Training Strengthened

The Analysis and Production Directorate has developed a Strategic Communications Plan to engage the workforce in a two-way information exchange on quality. The plan includes briefings and training on the Terrorism Prevention Act, intelligence reform and various quality activities. It also aims to build understanding of the directorate's strategic vision.

Another training initiative is a three-day, intermediate-level Structured Analytic Tools and Techniques Workshop. Structured analysis uses tools and techniques to mitigate bias and mindsets by exploring and challenging analytical arguments. Participants are introduced to 14 tools that have proven to be very effective in reducing analytical errors and strategic surprises in intelligence analysis. Examples of these tools include a key assumptions check, a look at indicators, brainstorming, an analysis of competing hypotheses and the "devil's advocate." These tools and techniques have been taught throughout the IC, including the CIA, Defense Intelligence Agency, Department of Homeland Security and FBI.

#### Quality Programs Expanded

NGA has expanded the Intelligence Quality Review Program from a single office to multiple locations. This expansion increases the number of post-production reviews available to NGA's intelligence production offices as well as the capacity for hosting managers, analysts and editors in a two-week guest review program. During the two weeks, guests learn how to efficiently and effectively review intelligence products and provide constructive feedback to producers using the NGA quality-assurance checklists. These have been revised to align with standards of the Office of the Director of National Intelligence (ODNI).

An initiative currently under way, called Critical-to-Quality (CTQ), focuses on the efficiency and impact of analysis.

Data integrity is crucial to carrying out the mission and ensuring that appropriate intelligence is analyzed consistently and proportionally to the issue. Providing a systemic approach to performance analysis, CTQ is assisting NGA in conceptualizing new ways to operate and identifying the associated changes involving people, processes and technical capabilities. CTQ is designed to facilitate the quality of intelligence, increase productivity and improve communications with NGA customers, stakeholders and mission partners.

Several quality-enhancing forums have been carried out. Most recently NGA conducted a senior-leader offsite focused on analytic quality. Guest speakers from ODNI briefed on issues related to quality. The leaders identified a number of promising best practices that they will explore further in their organizations.

#### Hard Problems Studied

NGA participated in the DNI's 2007 Summer Hard Problem Program (SHARP). This initiative was conceived by ODNI to improve the quality of analysis, as called for by Congress and the Commission on Weapons of Mass Destruction. Participants engaged with external experts on a problem of critical interest to the IC. The program lasted four weeks and enhanced the IC's ability to collect, analyze and integrate intelligence relevant to threats to national security. NGA will continue to identify methods and processes for improving analytic quality in partnership with ODNI.

In the future, GEOINT analysis will continue to be applied across regional and global issues. Analysis will vary with complexity and require data models and standards that allow interoperability. Recognizing the need for the future is one step in ensuring quality of analysis. Carrying out the need and implementing it strategically across the IC ensures our national security. P

**DANIELLE HENDERSON**

is the Geospatial Intelligence Quality Assurance Office Communication and Outreach Officer.



## FOCUS AREA 4

### DEVELOP AND EXECUTE A COMPREHENSIVE COMMERCIAL IMAGERY STRATEGY

# Commercial Imagery Strategy Focused on End-user

BY JEFF J. LEONARD AND LYNN MUELLER

As an unclassified source, commercial imagery is used extensively when data sharing and interoperability are critical; this ability to share is an immensely valuable asset. Commercial imagery is available in many different resolutions, spectral bands, modes and accuracies, supporting a diverse array of defense, intelligence, federal, civil and coalition partners. Applications range from defense and military operations to disaster response and relief efforts.

NGA's commercial imagery strategy has three components:

1. A **focus on end-users** of commercial imagery in the National System for Geospatial Intelligence (NSG) and the tools, training and infrastructure to support them
2. An **acquisition strategy** that ensures access to all relevant commercial imagery sources across NGA's customer base
3. **Web services and tools** to support ordering, ingesting, discovering, disseminating and exploiting commercial imagery across domains

### Focus on End-users

In the first six months of 2007, the outreach staff of NGA's Commercial Remote Sensing (CRS) program briefed or attended more than 45 events. Outreach briefs, covering topics such as program overview, policy, licensing, capabilities, current architecture and discovery and dissemination tools, have reached over 1,000 end-users.

In addition to traditional defense and intelligence customers, audiences included civil agencies such as the Bureau of Land Management, Forest Service, National Oceanic and Atmospheric Administration, U.S. Geological Survey and the Office of Surface Mining and many others. Demand has nearly doubled in the past year.

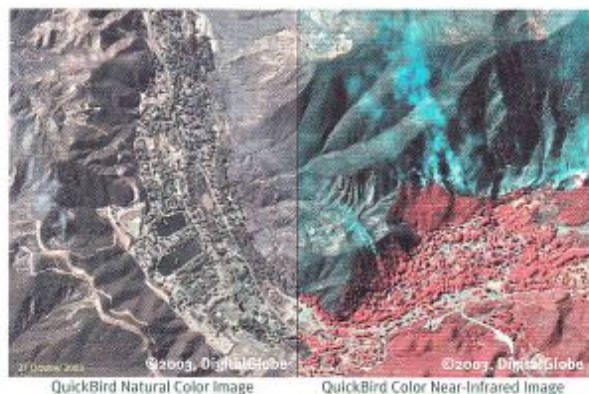
Commercial imagery representatives sit at various NGA and customer facilities to offer support on demand to commercial imagery users. NGA is also working to incorporate commercial imagery into its formal training programs.

### Acquisition Strategy

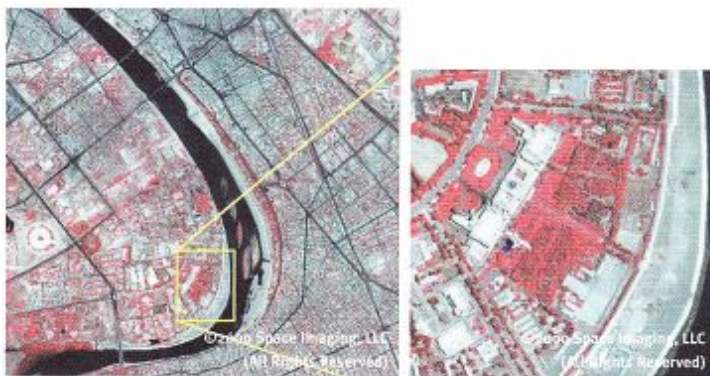
Through its NextView program, NGA is monitoring the development of two commercial satellite systems to ensure the future availability of commercial imagery for customers. NGA guarantees the availability of high-resolution imagery from U.S. commercial satellites through contracts under this program. Both satellites are scheduled for launch this year. NGA also gathers satellite and airborne imagery from civil, foreign and other commercial sensors.

To ensure best value for its customers, NGA has negotiated broad licensing agreements that allow for the same image to be shared by users in the defense and intelligence communities. Dissemination statistics indicate that each image is used an average of 2.8 times.

Since 2000, NGA has acquired approximately 66 million square kilometers of high-resolution commercial satellite imagery. Given increasing demand, NGA projects that it



Lyle Creek, Calif.: Comparison of natural color versus near-infrared multispectral bands reveals in contrast burned areas from the still-healthy vegetation.



Baghdad, IZ: Inset of a GeoEye near-infrared composite reveals well-watered palace grounds with pool. Water's absorption of infrared energy produces returns that indicate the deep end of pool (north).



will buy more than 69 million square kilometers in both fiscal 2008 and 2009.

### Web Services and Tools

NGA's primary exploitation and production system, the Integrated Exploitation Capability, is being upgraded to provide analysts the ability to discover, retrieve and download commercial imagery. Already deployed to several sites, the upgrade allows commercial imagery to be delivered and exploited much like national sources.

Infrastructure modifications are under way to accommodate increases in data volume from future U.S. satellites and from the growing number of foreign satellites and commercial airborne sources. This will allow users to take full advantage of expanding capabilities and different types of commercial data.

NGA offers Web-based information management systems that provide the capability to capture customers' commercial imagery requirements, perform geospatial imagery research, order commercial imagery and download imagery on all networks.

### A Look Ahead

NGA has made significant progress in its comprehensive commercial imagery strategy and is investing in its

infrastructure to prepare for the future. Two major challenges to the successful accomplishment of this objective are the standardization of data and the dissemination of very large volumes and varieties of data. As the number and variety of sensors and the volume of data they generate increases, NGA must promote, develop and adopt standards that will allow for these to be efficiently ingested into the NSG.

NGA is actively pursuing transition of U.S. high-resolution commercial satellite imagery to the National Imagery Transmission Format (NITF) standard of the Department of Defense and Intelligence Community. Compliance with NITF 2.1 will provide enhanced imagery compression and metadata (information describing a dataset) and improve data flow. Because NGA's customer base is not only geographically dispersed, but spans a broad spectrum of infrastructures, the dissemination demands related to commercial imagery are equally complex.

Bolstered by the accomplishments to date, the CRS Program is committed to full-scale implementation of the comprehensive commercial imagery strategy that is so critical to NGA's mission to provide accurate, timely, meaningful GEOINT to its customers. P

#### JEFF J. LEONARD AND LYNN MUELLER

Jeff J. Leonard has more than 20 years' experience in commercial remote sensing, including 10 years as president of EarthData International. He is currently a contractor employee supporting the NGA Commercial Solutions Division.



Lynn Mueller was an account manager with SPOT Image Corp. and Erdas Inc. and Director of Sales for Core Software Technology. She is currently a contractor employee supporting the NGA Commercial Solutions Division.



## FOCUS AREA 5

INTEGRATE AIRBORNE WITH NATIONAL TECHNICAL MEANS AND OTHER SOURCES

# Three Achievements Crucial to Airborne Integration

BY GENE REICH

**The challenge of airborne integration is considerable, encompassing systems, processes and lines of jurisdiction. However, NGA's vision for airborne integration is clear.**

"In order for airborne integration to be successful, the geospatial intelligence (GEOINT) data source needs to be invisible to the user community," the Airborne Executive Agent of the National System for Geospatial Intelligence (NSG) said. "National Technical Means, airborne and commercial data should appear together in the same profile, allowing the analyst to select the best imagery to meet stated requirements. We must develop a seamless enterprise solution with common standards to allow interoperability among all relevant systems: one GEOINT source—one Agency solution!"

Getting to "one Agency solution" will not be easy. However, the payoff of airborne integration for NGA and the NSG could be enormous. Mindful of the benefits, the Airborne Executive Agent remains focused on the interlocking tasks of building systems, building processes and—most importantly—building relationships to advance airborne integration.

"We must continue to strengthen the NSG airborne community so we can share available resources to fill capability gaps," the Airborne Executive Agent said. "Reaching out to the services, Office of the Secretary of Defense Joint Functional Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR), Joint Unmanned Aircraft Systems Center of Excellence and Department of Homeland Security, for example, are essential for our success in moving airborne integration forward!"

In the Airborne Executive Agent's view, three achievements are essential to airborne integration:

The first is the ability to bring airborne imagery from the key tactical platforms—Predator, Global Hawk and U-2—into NGA,

and then disseminate it to the NSG. This critical step was realized in 2003.

The second key achievement deals with integrating airborne into analysis. The standup of several Airborne Centers within NGA was vital to bringing airborne into the flow of time-dominant operations and value-added analysis.

The third key achievement—yet to be accomplished but well under way—is the integration of airborne data with all other sources of geospatial intelligence (GEOINT).

The Airborne Executive Agent sees the boom in development of unmanned aerial systems and the flourishing industry in airborne imagery as helping to provide robust support to GEOINT in the years ahead. He emphasizes that the key to exploiting the value of airborne is integration.

How will we know airborne integration has arrived? The Director of Source Operations and Management scarcely paused in offering an answer.

"Someday there will no longer be 'airborne program managers,' 'airborne executive agents' or 'airborne tasking protocols,' said the Director. "When that happens, and airborne seamlessly flows through NGA and the NSG along with other sources, then airborne integration will be a reality." P



Photo courtesy of NASA



## Airborne Reconnaissance Makes a Return

BY GENE REICH

Satellites are now synonymous with strategic reconnaissance. But it wasn't always this way. For most of the 20th century, overhead imagery was captured from platforms operating within Earth's atmosphere, first balloons and then aircraft. During a significant portion of the Cold War, airborne collectors—such as the U-2 and the SR-71—were essential for meeting our needs for national imagery.

With the Corona program of the 1960s, satellites began collecting strategic imagery. By today's standards, the first generations of satellites were primitive, but the technology of satellites and their supporting systems advanced rapidly. Soon, through their combination of reliability, resolution and comparative invulnerability, satellites came to dominate overhead imagery collection. As satellites assumed a central position in strategic reconnaissance, airborne collectors moved to the periphery, serving mainly to support the tactical requirements of combatant commands.

Just as advances in technology put reconnaissance satellites on the map, it was technology that triggered the resurgence of airborne. The Bosnia conflict was the testing ground for the Predator, an unmanned airborne collector produced under the Defense Department's Advanced Concept Technology Development program. In Bosnia, the Predator demonstrated its capabilities and proved it is possible to conduct airborne-intelligence collections without a pilot.



Photo courtesy of NASA

This success inspired creation of a second generation of unmanned aerial systems, the Global Hawk, which flies higher, farther and faster than the Predator. In addition to these unmanned craft, the venerable U-2 is still providing intelligence.

In Operation Enduring Freedom and Operation Iraqi Freedom, airborne collectors—manned and unmanned—have proven their value. Further, in the threat environment of the global struggle against violent extremism, where priority targets are often highly mobile, airborne platforms offer the advantage of being able to loiter over an area for extended periods. "Clearly, airborne intelligence collection is here to stay," said the Director of the NGA Source Operations and Management Directorate. "Our objective—and our challenge—is to integrate the wealth of airborne material into NGA and the National System for Geospatial Intelligence."

### GENE REICH

is Chief of the Communications Branch in the Source Operations and Management Directorate.





## FOCUS AREA 6

### IMPLEMENT AN INFORMATION TECHNOLOGY STRUCTURE TO PROVIDE ACCESS TO AND DISCOVERY OF GEOINT

# Access on Demand Is Goal of GEOINT Online

BY GARY W. FULLER

**Focus Area 6 addresses the need for online, on-demand access to geospatial intelligence (GEOINT) across the National System for Geospatial Intelligence (NSG).**

Providing interactive discovery of and access to GEOINT in a user-friendly, highly responsive environment is the focus of GEOINT Online. This initiative will provide more than a portal, a Web page or a system; the culmination of many people's efforts, it will integrate many systems and establish a new business model for NGA. (See "New Business Model Enables GEOINT Online" in the November-December 2006 Pathfinder.)

GEOINT Online will horizontally integrate NGA's existing online capabilities. The process of horizontally integrating user interfaces and underlying capabilities involves such systems and Web sites as NGA-Earth, Palanterra™, the Analytical Spatial Data Initiative/Top Drawer, Portal and Gateway, and Net-Centric GEOINT Discovery Services (NGDS) and electronic print on demand.

With GEOINT Online, internal and external users will be able to find, view and analyze GEOINT through a Web browser interface or by using the Google Earth™ and ArcGIS Explorer™ (AGX) client applications.

There has been accelerated progress in developing online GEOINT capabilities over the last year, and an even greater amount of progress is anticipated in the coming year. In June, Google Earth™ rolled out on two military networks, and by the end of this year, AGX will also be available. These applications complement the capabilities available through a Web browser interface by providing three-dimensional visualization and the analytical capabilities of a geographic information system.

With the capabilities of multiple discovery and access systems through GEOINT Online, NGA's partners will have a much better capacity for finding and retrieving the GEOINT they need. GEOINT Online will provide intelligence reporting, imagery from National Technical Means or commercial sources, including airborne, and maps and charts produced by NGA through a single interface.

GEOINT Online is not only about content. It will also provide integrated access to an array of services to be provided by NGA experts and to a comprehensive set of support capabilities that will range from online tutorials to discussion forums and a searchable knowledge base.

GEOINT Online will provide a unified Web presence for NGA that will equally benefit external and internal users. It will not only combine existing capabilities, but, more importantly, it will move NGA closer to being an online, on-demand service that brokers GEOINT between providers and users based on their needs and proactively populates databases and servers so that users can discover and access what they need. When content is not available, they will be able to order it quickly and easily.

To create GEOINT Online, a range of data-manipulation Web services is being applied to NGA content and embedded within NGA systems.

Though there are many challenges ahead, the end state of GEOINT Online is a self-service interaction model that enables partners and customers to intuitively discover and access the NGA content, services, expertise and support they need to accomplish their diverse missions. P

#### GARY W. FULLER

is an Executive Advisor supporting the Geospatial Intelligence Enterprise Integration Team as a contractor employee. He has supported the Intelligence Community for 35 years as a government employee, development contractor and consultant.





## FOCUS AREA 7

ADVANCE BASIC RESEARCH AND DEVELOPMENT OF LEADING EDGE SCIENCE AND TECHNOLOGY

# InnoVision Directorate Focuses on 'After-Next'

BY VONNA WEIR HEATON

**The InnoVision Directorate decides where to focus** research by exploring existing science and technology that has capabilities moldable to the requirements of NGA and the broader National System for Geospatial Intelligence (NSG). Essential to this effort is collaboration with partners in the Department of Defense (DoD), Intelligence Community (IC), industry and academia.

InnoVision looks out to the "after-next," or the next five to 10 years, every step of the way. Examples of initiatives the directorate has taken range from examining new bioterrorism threat-detection tools to testing applications of neuroscience to the work of intelligence analysts.

(An article in the November-December 2006 Pathfinder, "Automated Imagery Analysis: Is Science Fiction Becoming a Reality?" discusses applications of neuroscience to intelligence work.)

One of InnoVision's prime examples of collaboration resulted from an employee survey of the work environment. In large part because employees expressed a need for better search capabilities, InnoVision launched an investigation of Web 3.0, a new way to access data through content-related technology in place of key-word searches.

In working to redefine geospatial analysts' future work environment, InnoVision considers multi-intelligence and cross-domain capabilities first. For example, NGA recently partnered with the Defense Intelligence Agency to co-sponsor an initiative that focuses on the coordination of IC-funded academic programs.

NGA's Chief Scientist, Harold "Greg" Smith, is a member of the Intelligence Science Board, which works to share knowledge on the scientific and technical challenges facing our nation. As an active member of the National Intelligence Science and Technology Committee, which includes all of the IC research-and-development program managers, he also works with other members to set priorities and enhance collaboration.

Moving forward, InnoVision has plans to pursue advances like three-dimensional visualization and virtual mapping. As always, the goal is to adapt leading-edge science and technology to the needs of NGA's customers for the best geospatial intelligence the Agency can provide. P



## R&D Requires Open Exchanges of Brain Power

BY VONNA WEIR HEATON

Developing basic research prudently requires broad collaboration among our academic, industry, Department of Defense (DoD) and Intelligence Community (IC) partners. Open exchanges of brainpower and resources help promote the bonds needed to drive progress. Some of the ways we collaborate with other experts in research and development (R & D) include programs that we've developed in InnoVision, such as the IC post doctoral fellows program and our support to academic studies focused on expanding basic science initiatives. In addition, best practices from subject matter experts across the IC, DoD, academia and industry are incorporated into our own programs.

The potential return on investment from a successful basic research initiative tempers the high risks involved with pursuing it. We are driven by leadership's tolerance for risk-taking and the need to push for new technologies that improve the Agency's effectiveness. The far-reaching nature of basic research means it won't always yield usable technology, but the knowledge gleaned from the work is invaluable.

Because of the associated risks, InnoVision's basic research is the most fragile element of our program. Fundamentally, conducting basic research is "thinking outside the box." This thinking should be informed by today's issues, but not limited by them. The scope of research should look beyond today's capabilities but should not ignore them. This is the delicate balance that we maintain in order to push capabilities of the National System for Geospatial Intelligence forward.

To cultivate our field of knowledge at NGA, we not only recruit at the junior analyst level, but also through an initiative known as the visiting scientist program, which seeks out expert scientists to temporarily work side-by-side with senior InnoVision experts. This effort brings qualified scientists here to walk in the geospatial scientist's footsteps and experience NGA challenges firsthand. As we aim to recruit and retain top-notch scientists, we also consider those already established in geospatial sciences and up-and-coming science-minded students. From government to contractor personnel, ensuring our workforce's bright future in geospatial intelligence is a top priority.

### VONNA WEIR HEATON

as Director of NGA's InnoVision Directorate, is responsible for the Agency's research and development program. She was a Group Director in Source Operations and Management before assuming her current position.





## FOCUS AREA 8

ACHIEVE FRONT-END/BACK-END ALIGNMENT EXTENDING FROM INTEGRATING COLLECTION PLATFORMS TO BUILDING A FOUNDATION KNOWLEDGE BASE TO PROVIDING COMPREHENSIVE ACCESS TO AND ASSIMILATION OF NGA PRODUCTS AND SERVICES

# Diverse Alignment Activities Focus on Customer

BY MARK SHELBERG

**“Achieving front-end/back-end alignment”** refers to examining and adjusting all intermediate steps within the geospatial intelligence (GEOINT) processes to focus on, and drive toward, the specific desired outcome. This expansive “alignment” concept encompasses all stages of the tasking, collection, processing, exploitation and dissemination (TCPED) cycle.

On the surface, front-end/back-end alignment appears to be a complicated concept; but in fact it boils down to the simple notion of synchronizing the “front end” (providers and users of GEOINT products) with the “back end” (analysts, operators and mission partners).

Front-end/back-end alignment reinforces the central role of the customer. It is essentially about supporting NGA’s partners with a heightened sense of urgency, eliminating stovepipes, and both physically and virtually converging people and processes to maximize collaboration.

### Reducing the Gap Between “Ends”

Over the past several years, NGA has steadily progressed toward front-end/back-end alignment, even when NGA called it something different. Most notably over the past year, NGA has forward-deployed and embedded more people, more data and more equipment with its partners than ever before. NGA has dedicated more analysts back home to providing direct support and to working the tough issues of the global war on terror. On a daily basis, deployed geospatial and imagery analysts and staff officers, especially those supporting Iraq and Afghanistan, provide highly tailored products to meet the immediate operational needs of our warfighters.

In terms of data and equipment, the Geospatial Intelligence Library was deployed a few years ago to the U.S. Central Command (CENTCOM) area of responsibility (AOR). This is a repository that houses in theater all of the GEOINT data for the CENTCOM AOR previously stored on servers back in St. Louis and Washington. This local solution has facilitated the rapid creation of compact discs,

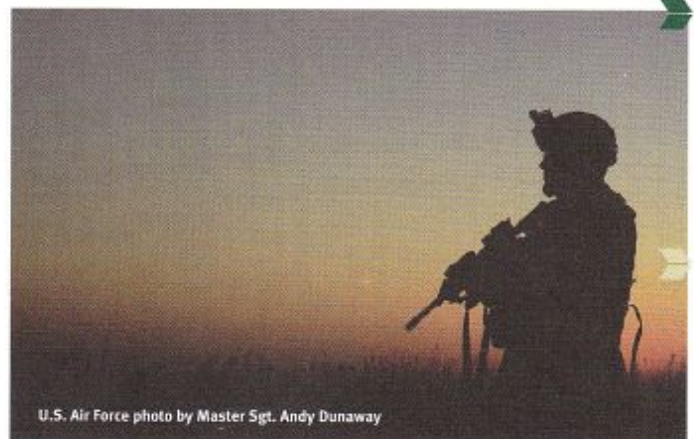
DVDs and other high-capacity storage devices that can quickly be distributed to units. NGA has also embedded Remote Replication Systems around the world—on land and at sea—to swiftly produce tailored products for customers on demand.

This type of support—moving people, data and equipment closer to the GEOINT end user—best exemplifies the true intent of front-end/back-end alignment: It enables direct and immediate interaction among planners, collectors, producers, operators and users—significantly reducing the gap between the “ends.” As a result, NGA is providing the best possible, most timely, tailored and relevant GEOINT to joint warfighters—wherever, whenever and in whatever form they need. In other words, NGA accommodates its customers’ decision-making cycles, not vice versa.

Through a combination of embedded analysts and support personnel, suites of supporting systems and equipment, and robust reach-back capabilities, NGA provides responsive direct support an array of customers. They include the National Counter Terrorism Center and National Counter Proliferation Center, service intelligence centers and other intelligence agencies, and the Defense Joint Intelligence Operation Center (DJIOC), combatant commands (and their respective JIOCs) and some subordinate command components. NGA’s unique relationship with these partners further achieves front-end/back-end alignment because it is at these centers, agencies and commands where collaboration is the norm, and information sharing across the intelligence disciplines is commonplace.

NGA, in partnership with U.S. Joint Forces Command, is working with the community to ensure this collaboration is captured in GEOINT doctrine, procedures and training to ensure it remains a consistent, fundamental business practice. Such actions directly enable and reinforce NGA’s partners’ central role in the effective application of GEOINT to support operations and tactical missions.





U.S. Air Force photo by Master Sgt. Andy Dunaway

### Community-Wide Collection and Reporting

NGA's Source Operations and Management Directorate has made great strides in developing integrated source collection strategies to best respond to customers' requirements. From the identification of a specific intelligence need, NGA source analysts assess and task all available collection assets—satellites, aircraft and other platforms, including national, foreign, commercial and civil systems—and even leverage other intelligence disciplines to answer the hard questions. On the back end of collection, NGA is tapping into community-wide collection and reporting to help analysts in the National System for Geospatial Intelligence (NSG) develop tailored, multi-source products for maximum value to the customer.

In May, NGA stood up a new office to integrate the various 24x7x365 critical operations across NGA and improve the Agency's global situational awareness. The Office of Time-Dominant Operations is responsible for indications and warning, safety of navigation, targeting, constellation readiness, throughput management and data delivery, tipping and queuing for other sensors and sources, and several other operations. This office will also help ensure that NGA provides its partners with a single, integrated, timely GEOINT picture of a particular issue.

### "Upstream" Data Fusion to Become Operational

Finally, NGA's InnoVision Directorate is involved in many research and development initiatives that will fundamentally shape front-end/back-end alignment across the community. One of these is the Global Net-Centric Surveillance and Targeting (GNCST) program. Over the past several

months, the GNCST team has significantly enhanced a prototype that extracts and fuses data "upstream" of normal processing, to help warfighters and analysts locate their most challenging targets faster and more precisely. GNCST is on track to become a community-wide fusion "service" that uses net-centric standards to discover and fuse data from a wide variety of national and tactical sources. GNCST is expected to become operational in late 2008.

Front-end/back-end alignment is not achievable overnight, and NGA still has far to go. Future challenges include getting data and products to remote users more quickly; eliminating organizational barriers, such as varying security levels and incompatible network environments; improving virtual collaboration; and finding better ways to incorporate the data that customers collect in the field. Nonetheless, NGA has made significant strides in a relatively short time. And with every success, NGA institutes new and better ways to serve NSG customers—the ultimate goal of front-end/back-end alignment. P

#### MARK SHELBERG

is Deputy Chief, Strategic Planning, Programs and Performance, Office of Geospatial Intelligence Management.





## FOCUS AREA 9

BUILD NEW AND ENHANCE ENDURING INTERNATIONAL PARTNERSHIPS – GLOBAL PARTNERSHIPS  
THAT MAKE BIG CONTRIBUTIONS

# Actions Taken to Build International Relationships

BY ANITA DAVIS

It is no coincidence that Focus Area 9 is rooted in imperatives set forth in national intelligence, security and defense strategies, as well as Defense Security Cooperation Guidance. All of these documents recognize the centrality and urgency of effectively addressing the threat posed by terrorism, hostile states and alliances and the spread of weapons of mass destruction, and all emphasize the need to expand and deepen our international relationships.

### Relationship Criteria Established

NGA's International Affairs Steering Group has developed new criteria for establishing international agreements as one of the actions identified by senior leaders for Focus Area 9. After reviewing procedures and sizing up the

decision process, the steering group approved a new set of evaluation factors last December.

The new criteria enable NGA to determine the resources that would be required to support a new foreign relationship and the benefits that would be derived from the relationship for NGA and the Intelligence Community. They ensure that a unified and deliberate approach is used to build and maintain international relationships and that all international relationships comply with the directives of the Director of National Intelligence and Department of Defense, as well as underpin mission-specific needs of NGA. The criteria have already been successfully applied to potential new relationships.



U.S. Air Force personnel discuss issues with their Australian counterparts at the base operations building on Royal Australia Air Force Base, Darwin, Australia.



## Knowledge Base Developed

In another action, NGA's Office of International Affairs and Policy has developed a knowledge management tool called Customer Insight Manager (CIM). Each of NGA's relationships with foreign partners is varied and often complex in the amount of information that must be shared across the Agency for these partnerships to be successful. CIM allows NGA to track all the information necessary to make informed business decisions.

CIM pilots have brought together those pockets of NGA organizations that deal with international partners. Common threads such as robust contact information, trip reporting, issue tracking and access to agreement specifics are all important facets of NGA's country interactions that now can be captured in a single database.

Training for CIM was completed in June 2007. Representatives of all members of the pilot organizations have developed an initial set of business rules to ensure fidelity and accuracy of the data. Data will continue to be refined, and the database will continue to evolve as additional enhancements are delivered through NGA's GeoScout modernization program.

## Country Team Plan Finalized

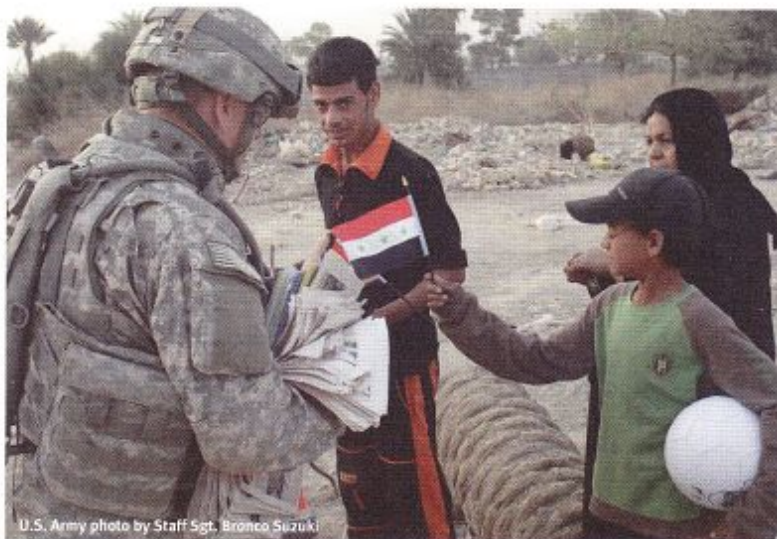
In a third action, the International Affairs Steering Group is finalizing a new process for preparing country-specific implementation plans. Under this action, country teams with expertise from across NGA will prepare detailed, partner-specific plans and programs to achieve the intended outcomes for supporting a relationship. Each plan will be vetted through the steering group before implementation.

A centralized management/decentralized execution approach to resources and actions supporting international partnerships is the cornerstone for success.

NGA must rely on the broad knowledge and skill base from many different offices and disciplines in order to make the country team concept work successfully. These multi-disciplinary teams create a seamless integration of geospatial intelligence, policy, production and systems support for each international partnership.

## The Payoff

International partnerships render a wide array of benefits. For example, our warfighters can receive enhanced geospatial intelligence (GEOINT), such as more accurate place names, resulting from a co-production agreement.



U.S. Army photo by Staff Sgt. Bronco Suzuki

*A U.S. Army Soldier hands out flags and newspapers to local nationals in the Muthana area of East Baghdad, Iraq, April 21, 2007, during a cordon and search operation with Iraqi army soldiers from 1st Company, 2nd Battalion, 4th Brigade, 1st Iraqi Army Division.*

Conversely, a foreign partner can be better prepared to assist the United States in a crisis or in a coalition environment through experience gained in a partnership.

Forging relationships with foreign partners has become more important as the globalization of GEOINT continues to expand, and as coalition activities grow in response to world situations, ranging from the global war on terror to disaster relief. ■

### ANITA DAVIS

is an NGA Staff Officer in the Strategy Cell, Office of International Affairs and Policy.





## FOCUS AREA 10

TRANSFORM MISSION PERFORMANCE THROUGH THE NEW CAMPUS EAST AND FURTHER DEVELOPMENT OF OUR FACILITIES IN THE WEST

# New Campus Moves from Plans to Implementation

BY DR. EILEEN M. PREISSER

Over the past 12 months NGA has made significant progress in the planning and coordination necessary for a successful move to the New Campus East (NCE) at Fort Belvoir, Va. Construction is set to begin this fall, with completion of the building in 2011.

Base Realignment and Closure (BRAC) legislation mandated that NGA consolidate its East Coast operations at Springfield, Va., by Sept. 15, 2011. NGA embraced the consolidation as an opportunity to maximize collaboration among diverse groups and gain efficiencies in operations.

Planning for NCE has focused on physical construction, mission enhancements and process improvements. All are aimed at providing partners time-dominant geospatial intelligence (GEOINT) while managing resources from across NGA economically. NGA also expects to capitalize on increased synergies among its many operational units with the move to a single campus in the East.

### Data Center West Established

The *cine qua non* (literally "without which, not") of the move is NGA West. The Agency has established an NGA Data Center-West (NDC-W) to ensure the continuity of mission operations during the transition to NCE and beyond. In the first phase, NGA has installed a St. Louis Information Library (STIL) to allow migration of imagery data from current libraries in Bethesda, Md., and implemented new Web-based access services for imagery and other GEOINT holdings.

Consolidated operations at NCE will accelerate the development of new technologies and products by fusing GEOINT research and technology, especially technology dealing with information and computing. NCE will have a

high-tech, flexible, reliable, secure information-technology architecture. The infrastructure will include video, networks, workstations and enterprise management. This flexible IT environment will allow for the smooth integration of enabling technologies (as they emerge) for decades to come.

NGA is also using the move to re-examine and transform its corporate and operational processes and procedures. The new Workforce Support Center will be a physical center providing corporate services in one location. NGA will also initiate a virtual Workforce Support Center through an enterprise-level Workforce Support Web Portal. Such initiatives will create synergies and generate cost savings.

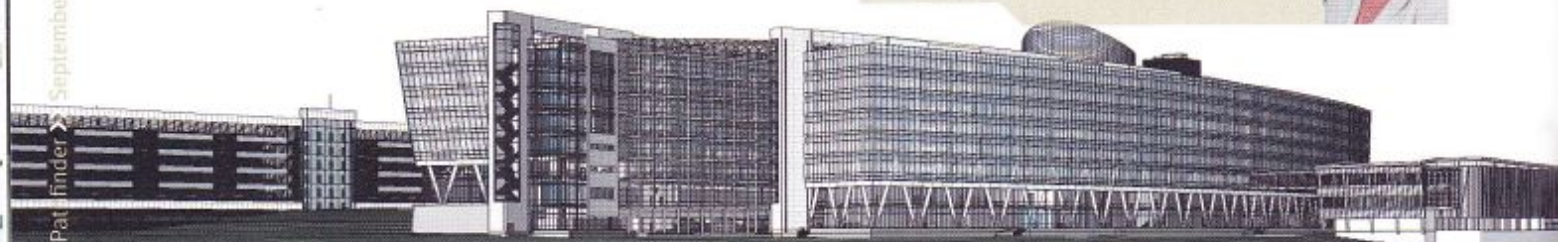
Among the synergies that will increase operational efficiency are:

- » streamlined administrative support services for headquarters and organizations
- » optimized logistics systems with centralized purchasing
- » an optimized production organization with integrated production and facilities
- » focused research and development on the most critical missions.

NCE will transform the way NGA supports its customers and allow the Agency to continue to provide high-quality GEOINT products and services. P

#### DR. EILEEN M. PREISSER

an NGA Geospatial Intelligence Officer specializing in collection and imagery exploitation, was matrixed to the New Campus East Program Management Office to direct the NCE Advocacy effort.





## FOCUS AREA 11

### MAINTAIN THE HIGHEST STANDARDS OF CONDUCT

# Do the Right Thing First

BY CYNTHIA R. RYAN AND DAVID C. HILL

**This focus area involves NGA employees in all their activities.** As similarly articulated by Undersecretary of Defense for Intelligence James R. Clapper Jr. in the last of his Ten Precepts of Leadership, "Last, but first, is integrity. Without it, the others don't matter." By maintaining the highest standards of conduct within the Agency, NGA fosters an environment where there is an expectation for everyone to do the right thing first. The primary goal is to promote an Agency culture of integrity, professionalism and honor.

Maintaining the highest standards of conduct is vitally important to the success of NGA's mission. By performing their jobs with integrity and professionalism, NGA employees build and sustain good reputations individually and for the Agency. This serves as the foundation for trust. Moreover, trust and mutual respect form the basis for collaboration. Collaboration is essential, as we cannot do our jobs alone or in a vacuum. By having a culture of integrity, professionalism and honor, people will want to work with us and for us. To sustain this culture there needs to be an Agency-wide mindset of "Do the Right Thing First."

While the current culture in place today at NGA is good, there is always a risk that if proper care is not taken, this culture could deteriorate. To that end, four areas are being

addressed to ensure that the currently vibrant culture of conduct enjoyed by employees today remains for years to come. The four areas vital to sustaining the culture are good practices and procedures, educating the workforce to know and do the right thing, promoting the culture and holding accountable those who do not do the right thing.

### The Way Forward

With input from each of NGA's key components, the Office of General Counsel is leading a team charged with examining current practices and procedures, including checks and balances, internal controls and training. Based on its findings, the team will set benchmarks for the future. It will then develop a plan to ensure NGA's success in meeting those benchmarks. Key elements of the plan will be training, positive reinforcement and holding people accountable.

Finally, the team will develop and implement a campaign to create awareness of the importance of maintaining the highest standards of conduct. NGA cannot afford to be complacent. "If we lose our excellent reputation, we derail our mission," a team member said. "To keep it, we must be vigilant. Therefore, we must make maintaining the highest standards of conduct first in all we do." P

**CYNTHIA R. RYAN AND DAVID C. HILL** (Not Pictured)

Cynthia R. Ryan is the NGA General Counsel.

David C. Hill was a legal intern with the Office of General Counsel.





## FOCUS AREA 12

### STRENGTHEN GOVERNANCE AND PERFORMANCE MANAGEMENT

# Strategy Achieved through Governance Framework

BY RICHARD FRAVEL

**This focus area recognizes the key roles that governance and performance management play in helping the Agency to achieve its strategic goals.** Governance in this context is a term that carries several meanings, but these meanings generally fall into three main areas: policies, processes and metrics.

- » Governance policies are the sets of precepts, customs and rules that direct, administer or control the planning and day-to-day work of the Agency.
- » Governance processes are the mechanisms such as management bodies, documentation and reports that the Agency uses to control and conduct reviews of its activities—both existing and proposed—and to gauge adherence to desired outcomes.
- » Governance metrics are the specific measures that provide insight into the Agency's achievements or rates of progress in key areas related to output and mission effectiveness. NGA's metrics effort is also the point at which governance activities intersect with the broad concerns and requirements of performance

management. Measuring and managing performance is ultimately the only way to ensure both current and future mission success.

The thread that runs through all these governance elements is accountability and communication. Each member of the workforce has a measure of responsibility for the success of the Agency's mission and the quality of the Agency's output in support of those who rely on NGA to inform critical decisions. NGA's governance and performance management framework provides a means for members of the workforce to collectively hold themselves accountable in the discharge of this responsibility.

The purpose of this Focus Area is to improve the various elements that together constitute NGA's governance effort. The principal aims are to bring greater clarity to key areas of strategic importance and to ensure that those areas are examined in a consistent, coherent and efficient fashion.

NGA's current governance processes include senior-level interaction and management forums that help formulate and evaluate the implementation of policy and





programmatic direction—not only for NGA but also for the National System for Geospatial Intelligence (NSG).

- » **Director of National Intelligence (DNI) and Under Secretary of Defense for Intelligence (USD/I):** At the most senior level, the Director of NGA (D/NGA) and Deputy Director of NGA (DD/NGA) frequently interact with the DNI and USD/I. The DNI Executive Committee (EXCOM), which includes the Directors of the Intelligence Community (IC) agencies and the USD/I in his role as the Director of Defense Intelligence, meets bimonthly to discuss IC collaboration and initiatives such as the Joint Duty Program and pay reform. The Director also meets regularly with the USD/I to review NGA topics and issues as part of the Agency's strategic governance mechanism. In these and other such interactions, NGA regularly briefs the DNI and USD/I on high-visibility issues such as the New Campus East and GeoScout.
- » **NSG Senior Management Council (NSMC):** The Director of NGA serves as the Functional Manager for the NSG. In this capacity, the Director chairs the NSG Senior Management Council (NSMC), a body composed of the directors and senior leaders of organizations with a substantial stake in the quality and availability of geospatial intelligence (GEOINT). The NSMC is the GEOINT community's most important senior coordination and review panel, and its major goal is to maximize the effectiveness of the NSG. Through the NSMC, NGA's managers gain the broadest possible perspective on the Agency's operational and development activities.

Within NGA itself, several interactive governance elements provide direction, evaluation or feedback. Principal elements include the following:

- » **Executive Committee (EXCOM):** The EXCOM includes the D/NGA, DD/NGA, Chief Operating Officer (COO), Military Executive (MX), Technical Executive (TX), West Executive (WX), Equality Executive (EX) and Chief Information Officer (CIO). These executives provide a source of senior review and recommendations on policy and programmatic decisions. They also oversee or advise on the implementation of selected activities within their individual spheres of responsibility.
- » **Executive Leadership Group (ELG):** The ELG includes the directors of all line and staff Key Components

(KCs). The group meets approximately twice a month to consider high-level policy and programmatic proposals and recommend decisions to the Director. The Director works closely with the ELG as the main senior forum for discussion and review of Agency-wide policies and governance decisions.

- » **Quarterly Reviews:** The ELG is also the mechanism for a formal program of quarterly reviews that focus on the Agency's operations, output and major development activities. The emphasis of these reviews is on progress and results rather than process. The quarterly sessions encourage information sharing among the KCs to broaden and deepen understanding of NGA's current and planned work. The reviews also strengthen the use of performance management metrics by these organizations. During these sessions, the KCs review their accomplishments toward major goals for the previous 90 days, project their way forward for the next 180 days and identify critical areas of concern. Through discussion and interaction, the reviews promote cross-KC input, understanding and unity of purpose toward NGA's mission.
- » **NGA Support Team (NST) Conference:** This twice-yearly gathering of NST chiefs and key team members with the Agency's senior leadership provides essential feedback from deployed NGA employees who work daily within the combatant commands, Defense Department, Homeland Security offices, IC agencies and other organizations. The feedback and interaction at these conferences illuminate concerns from this critical forward perspective and provide an initial basis to determine potential solutions to those concerns.
- » **Human Capital Management Board (HCMB):** The HCMB provides strategic direction and management oversight of NGA's personnel resources. Co-chaired by the COO and EX, this board includes the MX, TX, WX, CIO and directors of all line and staff KCs. The HCMB formulates, reviews and recommends corporate and strategic policies and decisions on issues such as training, education, position authorizations, recruitment, performance management and pay.
- » **Information Technology (IT) and Systems Acquisition:** The Agency is implementing a "managed services" approach to information technology based on





separate lines for application services and infrastructure services. This approach places the CIO at the apex of a governance structure that is focused on the delivery and operation of a coherent architecture that supports NGA's strategic direction. The principal governance mechanism used by the CIO is the CIO Steering Committee, which evaluates, prioritizes and regularly reviews potential Agency IT programs and projects. A critical element in IT alignment is the Chief Acquisition Executive, who is charged with governance responsibilities for NGA's acquisition strategy and procurement efforts, working with NGA's Senior Procurement Executive and the NSG Program Manager. This collaborative structure is aimed at ensuring and implementing strategically aligned decisions. It also provides a framework to ensure compliance with procurement rules and regulations, promote competition, ensure configuration control, manage IT security and oversee the implementation of policies and procedures.

- » **Employee Climate Survey (ECS):** The ECS, which is conducted annually across the IC, provides NGA managers detailed survey data on employees' perceptions of their work environment. For two years, NGA has used this data to initiate changes and process improvements in many areas, including IC collaboration, physical working conditions and the performance management system. Most recently, the EX has assumed oversight of NGA's ECS Action Plan; in that capacity, the EX is coordinating structured ELG reviews of the actions being taken to further address issues identified by employees.

Partner and external advisory boards also contribute to NGA's governance effort.

- » **Quadripartite Enterprise Board (QEB):** The QEB is the senior forum for reviewing and coordinating matters of concern in NGA's partnership with the Commonwealth GEOINT community. The QEB meets annually and includes senior leaders from Australia, Canada, the United Kingdom and the United States. The Director of NGA serves as the senior U.S. representative to the QEB. QEB sessions provide governance insight into the activities of the partnership. A separate Quadripartite Operations Steering Group (QOSG) also meets face to face annually to review and steer partnership activities on behalf of the QEB. This includes

directing the implementation of QEB strategies and priorities as well as synchronizing research and development efforts.

- » **NGA Advisory Group (NAG):** The members of this advisory group (the acronym is deliberate and enjoyed by its members) include retired flag-rank military officers, former senior IC leaders and senior corporate executives. The NAG meets quarterly with the Director and senior Agency managers to advise on selected programs as an aid in decision-making. The Director has invited all NAG members to attend NSMC, ELG and NST conference meetings to ensure broad insight into NGA's operations. The NAG also forms small research teams at the request of the Director to explore specific issues; recent teams, for example, have respectively examined issues related to the GeoScout program and commercial imagery.

As this interlocking web of processes, boards, metrics and policies indicates, NGA's governance framework is a complex arrangement. Its purpose, though, is straightforward: to help NGA achieve its strategic goals by providing a means to maximize the Agency's output and mission effectiveness. Governance activities achieve this purpose through a fundamental emphasis on directing and evaluating specific initiatives and objectives, reviewing Agency activities in a corporate framework to ensure coordination and coherence, and discerning areas where additional emphasis or course corrections are needed. Perhaps most important, the governance effort at NGA embraces and promotes interactive communication across the Agency's many elements, helping to bring them together as part of our common dedication to the GEOINT mission. ■

**RICHARD FRAVEL**  
is NGA's Chief Operating Officer.





## PARTNERSHIPS

# NGA and U.S. Coast Guard Come Together in Middle East

BY CRAIG DONOVAN

**NGA and the U.S. Coast Guard are collaborating** in the least likely of places: the Middle East. To be more specific, the Middle East NGA Support Team (NST) in Bahrain is working with Coast Guard units deployed to Naval Forces Central Command (NAVCENT) in support of the global war on terrorism. The NST proactively supports all the patrol boats of Patrol Forces Southwest Asia and Coast Guard teams deployed throughout the U.S. Central Command (CENTCOM) area of responsibility.

Coast Guard cutters routinely patrol the fishing grounds off the coastal United States and transit corridors of drug and human smugglers, allowing crews to know their "beat." Queries, approaches and boardings at sea by Coast Guard cutters occur in much the same manner, whether crews are searching for illicit narcotics or international terrorists.

The recent deployment of the Coast Guard Cutter *Midgett* was much like any other, only the beat was different: the Red Sea, Gulf of Aden and Somali Basin. Lack of knowledge of the operating area provided an opportunity for a timely injection of geospatial intelligence (GEOINT) to make "locals" of the *Midgett* crew.

While the ship was at anchor, a geospatial analyst with NGA's Remote Replication System, a NAVCENT geospatial analyst and a Coast Guard officer serving as liaison to NAVCENT paid the *Midgett* a visit. The visit included a briefing to the cutter's commanding officer on the various products available from NGA and the benefits of partnership.

### When a Chart Is More than Just For Navigation

The officers and crew of the *Midgett* were most familiar with NGA's nautical charts but were somewhat skeptical that a chart could show more than shoal waters and hazards to navigation. Through the use of a geographic information system (GIS), the NGA geospatial analyst demonstrated how a nautical chart could be layered with information, providing details far beyond the location of rocks and buoys.

NAVCENT's geospatial analyst demonstrated the resources available to the *Midgett*, including libraries of existing data and capabilities to produce custom products. He provided the crew with examples of custom products previously developed for CENTCOM customers, explained

the capabilities of the Remote Replication System and gave an overview of NGA's deployed Geospatial Intelligence Library.

The *Midgett* operations officer provided a tour of the ship's navigation suite and combat information center. As the two analysts directed crew members to various NGA Web sites, the lack of bandwidth available to the 35-year-old cutter brought the process of geospatial discovery to a crawl. It was clear that the *Midgett* required an alternate means of delivery.

### Delivering Products the Customer Can Use

At a port call, I was able to deliver imagery of scheduled and potential port visits. I also evaluated the utility of the products provided to date, which led to a free-ranging discussion of the various threats that exist throughout the Gulf of Aden and Red Sea. International terrorism, mass migrations of undocumented persons, overfishing and weapons smuggling were discussed as potential topics of geospatial analysis.

After this exchange, the Middle East NST developed a series of charts of the Red Sea with historical smuggling routes overlaid with NAVCENT operating areas. While pieces of information were known to individual members of the *Midgett* operations team, the synthesis of this information drew the enthusiastic approval of the ship's crew. The operations officer was clearly pleased with the results of this new relationship. He also noted that NGA produced the charts in a matter of days and hand-delivered them.

The *Midgett* crew has completed the NAVCENT chapter of its circumnavigation of the Earth. Meanwhile, the Coast Guard's relationship with NGA in this region continues to grow, as the Middle East NST in Bahrain ensures that those who stand watch in waters bordering the Arabian Peninsula "know the Earth." P

**CRAIG DONOVAN**  
is Chief of the Middle East NGA  
Support Team in Bahrain.



WORKING FOR NGA

## NST Chief Values Collaboration in NSA Footprint

BY JUANITA HARTBARGER

**The intelligence professionals at the National Security Agency (NSA) and NGA collaborate every day to produce tailored, timely and actionable multi-intelligence solutions to support military partners, the Intelligence Community (IC) and U.S. policy makers. The focal point for that collaboration is the NGA Support Team (NST) embedded within NSA. Since June 2006, Barbara Salvatore has served as Director of the NSA NST.**

Leadership at NGA isn't new to Salvatore. She was Director of the Leadership Development Program at the National Photographic Interpretation Center (NPIC), one of NGA's predecessor organizations. Later she was named Chief of the Exploitation Systems Laboratory within NPIC's National Exploitation Laboratory, and just before assuming her current position, she was Chief of the Iran-Central Asia Division and NGA's Iran Issues Manager.

But in the beginning, Salvatore's focus was on gaining broad expertise in the fundamentals. "I started at NPIC as an imagery analyst and worked all phases of analysis, doing everything from Soviet ground forces to civil unrest to disasters and environmental security," she said.

She sees her experience as providing excellent grounding for her current position. "I think that my background in intelligence and analysis, along with the years I spent collaborating with my colleagues at NSA on a variety of intelligence issues—as well as through community working groups—has helped me tremendously. When I came on board as NST Chief, I was able to speak their language and settle in quickly. On the other hand, it's amazing how much I continue to learn about a partner that I have worked with for over 20 years."

### A Model of IC Collaboration—With Some Unexpected Benefits

The fusion of geospatial intelligence (GEOINT) and signals intelligence (SIGINT) is not new. In the 1990s, NPIC established a liaison office at NSA. However, as Salvatore says, the nature of the collaboration has changed. "SIGINT professionals and GEOINT professionals have worked together for decades, but the partnership has evolved dramatically since they have been sitting side by side. In this environment NSA analysts come to better understand what GEOINT has to offer, and NGA analysts learn firsthand how SIGINT is an integral part of the total intelligence picture."





Some benefits of the NGA-NSA collaboration are not readily apparent, but that doesn't make them any less crucial to providing the best intelligence products and services to our colleagues and mission partners. For example, Salvatore points out that "NGA and NSA have leveraged each other's geospatial data holdings. They have also jointly funded data purchases of value to both agencies."

And the value added goes still further. According to Salvatore, "From a non-production standpoint, having NGA personnel embedded inside the NSA footprint has led to unprecedented cooperation and collaboration on, to name just two examples, crucial information technology issues and research and development."

Salvatore has seen the benefits of collaboration reach into at least one unexpected area, planning for NGA's New Campus East (NCE). As a member of the Culture Subcommittee of the NCE's Senior Advisory Group, she gained insight into the issues facing the NCE Program Management Office. "Because of the close relationship, we have

been able to put the NCE program office in touch with appropriate people at NSA to learn from NSA's experience in building large-scale facilities."

"Look outward and be the most collaborative partner with the IC and warfighter" is number one among NGA's 12 Focus Areas. "Create a culture of collaboration" is the number-one priority for the Director of National Intelligence. NGA's relationship with NSA is a premier model of the culture of collaboration and is just one example of how NGA is moving forward to become the most collaborative IC partner. At NGA, this is more than a theoretical construct.

As Salvatore says, "There have been many cases where SIGINT or GEOINT alone didn't tell a complete story. In fact, one or the other alone might not even have met a reporting threshold. Together, our pieces add up to a reportable story that has impact on the IC's knowledge base at a minimum and in many cases even helps to support operations in theater and influence national policymaker decisions." P

**JUANITA HARTBARGER**

Is a Public Affairs Officer in the Office of Corporate Relations, Strategic Communications Branch

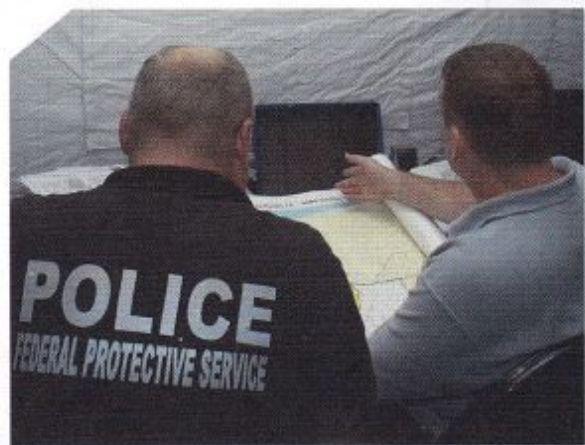




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## OUR HERITAGE

# GEOINT Analysis Reveals Life in Feudal Times

BY DR. GARY E. WEIR

In 1929 two French historians of medieval Europe reached their breaking point and rebelled. Tired of having the complex society of the Middle Ages reduced to histories of royal courts, summit diplomacy, wars and biographies, Marc Bloch and Lucien Febvre sought another approach. With very few surviving documents available to illuminate the centuries after the fall of the Roman Empire, they looked for additional ways of understanding their subject, only this time from the ground up. Rather than learn about kings, lords and wars, they wanted to know about villages, families, farming, commerce and the serfs, who were committed by the feudal system to work the land of the same manor for life.

Bloch and Febvre created the *Annales* approach to medieval history and a journal that carried the same name.

Very much like imagery or geospatial analysts, these historians carefully combined all available sources, some quite foreign to traditional historical practice, to understand their subject. Although Bloch fell to a German firing squad as a member of the Resistance during World War II, Febvre and others who survived into the postwar era discovered one of their most productive sources for medieval history in the aerial photographs taken during the conflict by the U.S. Strategic Bombing Survey. Examples can be found in Bloch's *Feudal Society*, which became a classic. The University of Chicago Press published one of the best versions of Bloch's book in 1961.

As analysts know all too well, imagery taken to assess bomb damage or plan new sorties can reveal much more to the trained eye. The careful observer can see old and



Photo by National Oceanic and Atmospheric Administration

*Aerial photographs like this one of Chinquapin, N.C., can reveal old and new tree lines, land distribution patterns for farming, and old property boundaries no longer in effect. Reliable geospatial context of this sort has permitted scholars to draw conclusions about medieval life in Europe.*





Photo by National Oceanic and Atmospheric Administration

new tree lines, land distribution patterns for farming, and old property boundaries no longer in effect. The survey photos taken in Europe during the war showed small rivers whose courses had changed naturally or by design, bridges no longer necessary but still in place, the nearly invisible scars left by old roads, relationships between medieval fortifications and the surrounding terrain for miles, and subtle physical suggestions of the field definition system used by the Romans when much of France constituted the imperial province of Gaul.

An *Annales* historian recently commented that combining sparse documentary evidence with new imagery analysis allowed him to observe about the region around the city of Béziers, France, that “the structure of these village fields has...remained remarkably constant for at least a millennium, despite frequent flooding and changes in the meanders of the river before it altered its course.”

Having access to a reliable geospatial context of this sort permitted scholars to draw conclusions about medieval life completely impossible before *Annales* rewrote the methodological rules, inviting and encouraging novel approaches and close collaboration between history and other disciplines. Analysts who recall the birth of geospatial intelligence (GEOINT) doubtlessly find these conclusions very familiar. Thanks to the initiative of Bloch and Febvre,

historians found the same power in all source-analysis that GEOINT has provided to the Intelligence Community.

Analysts and historians are professional cousins, driven by a desire to understand and displaying little patience for methods that will not permit sufficient insight. Some of the very same elements that permit GEOINT to provide deeper, multilayered understanding of a complex world also enable historians to reach across time to achieve some of the same goals. P

DR. GARY E. WEIR  
is the NGA Historian.





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