NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

PATHFINDER

The Geospatial Intelligence Magazine

PORTAL OPENS World of GEOINT

How We Do GEOINT Now

UAVs: Taking a Good Look

Coproduction Tackles the Globe

and much more...

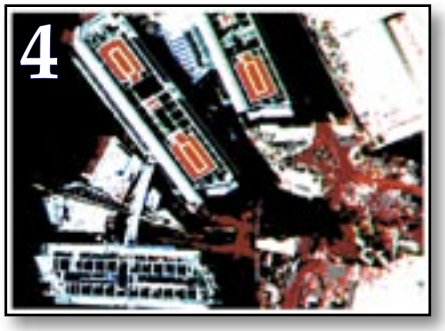
SEPTEMBER / OCTOBER 2004

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

PATHFINDER

SEPTEMBER - OCTOBER 2004 Volume 2, Issue 2

Contents



On the Cover

"How We Do GEOINT"—the theme of this issue—is about to change as the NGA Portal comes to desktops across the GEOINT community. The first major deliverable of the Agency's transformation, the Portal puts new power at the fingertips of users, allowing them to work faster and make better products.

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 second month before publication. For details on submitting articles, e-mail the Pathfinder. Our address is pathfinder@nga.mil

Published by the National Geospatial-Intelligence Agency
Director-Lt. Gen. James R. Clapper, Jr., USAF (Ret.)
Office of Corporate Relations, Director-Mark Schultz
Corporate Communications Division, Chief-Joseph Perry
Deputy Chief-Elizabeth Dann
Strategic Communications Branch, Chief, Louis Brune
Editor-Paul Hurlburt
Designer-Jason Collins
Cover Design-Edward Osann

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

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Dear Readers,

In our last issue, the Pathfinder laid out, in everyday terms and language, NGA's mission, goals, and vision, highlighting geospatial intelligence (GEOINT) as a powerful new analytic discipline. The current issue continues the story by focusing on the process of how NGA develops and produces GEOINT today.

The man most directly responsible for current applications—Steve Wallach, Director of NGA's Analysis and Production Directorate—leads off by discussing the move toward integrated operations. Always mindful of what's ahead, Steve also shares his insight on what to expect as GEOINT continues to expand and evolve.

The articles that follow demonstrate how NGA is using GEOINT to promote national security today as it simultaneously works to fulfill the vision of the National System for Geospatial-Intelligence (NSG). For example, our cover story on the new NGA Portal shows how analysts' lives are about to change, just as our personal lives have changed with Internet shopping and searching. In a departure from previous practice NGA has included an article in this Pathfinder on NGA Business Partner, EarthData Aviation, LLC, detailing its support of a U.S. Southern Command project to improve map information gaps in Colombia. We are experimenting with this concept as a way to showcase some of the exciting programs NGA is working on with the commercial sector. Feel free to share your thoughts with our editor by e-mail at pathfinder@nga.mil.

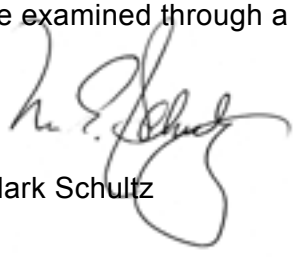
Of course, a single issue could not begin to describe the myriad of applications, as the people of NGA apply GEOINT to solving real-world problems. As samples we offer a look at—

- how unmanned aerial vehicles boost the power of GEOINT and promise to do even more
- what's happening with commercial imagery and multinational coproduction to expand mission capabilities
- why standards are crucial to future development and how NGA is addressing the issue
- what industry has to offer as illustrated by the example of EarthData, imaging beneath triple canopy jungle.

We conclude with two articles that deal with our most important resource—you—the people of NGA—military, government civilian and contractor. The first article shows the role of rotational assignments in developing leadership. The second challenges each of us to connect our roles to the Big Picture.

Coming Soon…

The next Pathfinder will focus on partnerships and integration. NGA's leaders will provide their perspective on what the Agency expects from industry in the year ahead. Integration will be examined through a variety of initiatives now under way. Be sure to get your copy.



Mark Schultz

Emergence of GEOINT Prompts Move to Integrated Operations

By Steve Wallach, Director
Analysis and Production Directorate

In the last Pathfinder, NGA's Director, retired Air Force Lt. Gen. James R. Clapper Jr., discussed the emergence of the geospatial intelligence (GEOINT) discipline and NGA's continuing push to transform all aspects of GEOINT. I would like to take this opportunity to relate the role of the Analysis and Production Directorate (P) in GEOINT today and in the future.

GEOINT Today

We play the central role in GEOINT, in partnership with the rest of the Agency and our extended partners across the National System for Geospatial-intelligence (NSG). GEOINT relies on harnessing the value of various NGA tradecrafts, including:

- ·aeronautical analysis
- ·cartography
- ·geodetic sciences
- ·geospatial analysis
- ·imagery analysis
- ·imagery and geospatial sciences
- ·marine analysis
- ·regional analysis
- ·source management analysis

GEOINT is essential to support critical mission areas including national security, military operations, safety of navigation, advanced weapons and systems development, and disaster and humanitarian relief efforts, both here and abroad.

We provide our customers with the GEOINT they need to succeed in an increasingly complex world. Our mission is vital to their success. Whether they need a quick answer to a question, long-term estimates, or mission-specific data sets, our GEOINT gives them the information they need to make policy and operational decisions.

We provide context. We help our customers understand the environment through accurate, meaningful, visual representations of the Earth and activities upon it. Our depictions provide situational awareness, facilitating customer decision making and action.

We precisely position. We ensure consistent geolocational accuracy, upon which our customers rely for targeting and safety of navigation. They depend upon the readiness and responsiveness of our GEOINT data and services, particularly amid heightened worldwide tensions.

We monitor and watch. We apply analytic expertise together with advanced sensing, reconnaissance, and increasingly persistent surveillance technologies to monitor priority events as they unfold. Thus we overcome our adversaries' denial and deception efforts and place them under greater risk of discovery.

We assess and discern. We assess and discern the significance of events across the globe through deep regional, issue-oriented analytic and technical expertise. To ensure the integrity of our analysis, we continually work to research and discover substantive targets, signatures and methodologies. This thorough knowledge, based on research, analytic continuity and robust content, will remain the hallmark of our analysis.

We anticipate, estimate and warn. We provide insight about the range of possible outcomes of activities. We conduct in-depth analyses, contribute to community estimates, and alert our customers with timely, actionable GEOINT.

Today, we continue to integrate our skill sets under a unified discipline, not to create "renaissance analysts," but to deliver teams of experts that capitalize on their combined talents. The synergy of our analytic strengths delivers the full power of GEOINT.

Today, we also rely on technology to provide access to information, speed in reporting and flexibility in delivery. This reliance is in fact likely to grow, as we take advantage of the opportunities presented by many new sources of geospatial data and new end-to-end automation capabilities.

GEOINT Tomorrow

As the threats to national security increase in complexity, the information needs of NGA customers will continue to expand. The progression of tradecraft, the availability of new sources, and the delivery of advanced

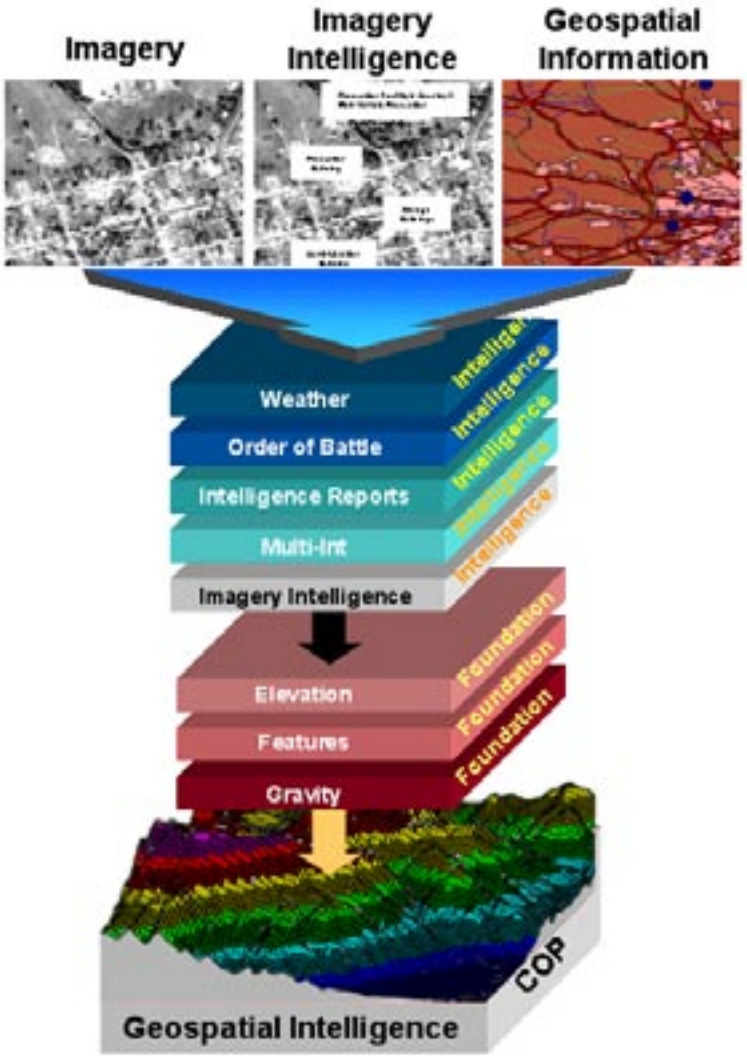
technology between now and 2010 will enhance our ability to solve our most complex intelligence issues and satisfy customers' global GEOINT needs.

These factors will also present us with many challenges. Our ability to provide customers with the GEOINT they need necessitates the integration of the skills, tradecrafts and processes across the operations directorates—namely Analysis and Production, Source Operations and Management, and Enterprise Operations. This applies to both substantive issues and operational planning and execution activities. It should result in enhanced content and services as well as operational efficiencies.

In 2010, GEOINT analysis will remain at the center of NGA operations. The Agency will retain, hone and evolve multiple complementary analytic tradecrafts. Analysts will refine their skills through broadening assignments and professional development opportunities. Our most valuable asset will remain our people. GEOINT analysis will be characterized by the application of a combination of these skills, sources and tools against a problem or information need.

Customers will be able to request content and services via the NGA GEOINT portal. The NGA analysts will interact closely with their customers to understand both their general and specific needs. Analysts and managers will form multidisciplinary teams in anticipation of GEOINT information needs, proactively preparing for worldwide events. In addition, these teams will promote mission and tradecraft knowledge throughout their communities of interest and practice.

To maximize the contribution of GEOINT analysis in solving intelligence problems, the Agency will focus on maturing four major



Providing a Common Operating Picture (COP) for decision-makers at all levels, geospatial intelligence is based on elevation data, features like roads and rivers, and gravity information. It fuses current information, such as imagery, intelligence from multiple sources (multi-INT) and weather, to provide users a graphic representation of all information.

elements of our tradecraft:

- methods (e.g., analytic and production techniques, procedures and practices)
- analytic depth (e.g., knowledge, skills, abilities, and experience)
- technology and tools required to perform our mission
- processes to train and support our workforce.

New technologies, sensors, tools and methods will pave the way for dramatic advances in the discipline of GEOINT. The specialized product and service lines of Advanced Geospatial Intelligence (AGI) will answer customer questions with unprecedented clarity. AGI is the technical, geospatial and intelligence information derived through interpretation or analysis using advanced processing of all data collected by imagery or imagery-related collection systems.

Routine analytic and administrative processes will be automated, streamlining procedures and assisting analysts in their work. Moreover, collaboration will become virtual and seamless among GEOINT communities of practice, allowing us to leverage the optimal mix of analytic capabilities.

Continued on page 6

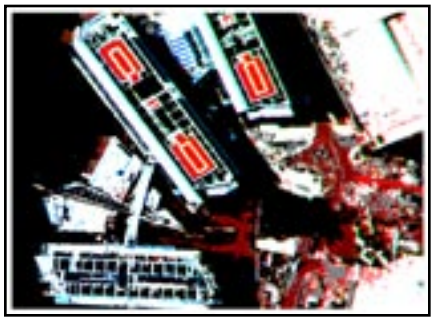
Emergence of GEOINT Prompts Move to Integrated Operations

Continued from page 5

End-to-end automation will shorten many of our production processes and enable us to keep pace in an environment of constantly increasing customer needs, problem complexity and source data. Process automation will effectively increase our analytic depth, allowing us to focus more resources on key national security issues. It will highlight priority information above specific thresholds, assist in critical analytic activities such as large area searches, and shorten the GEOINT finishing process. In addition, "knowledge management" capabilities will capture analytic processes and provide insight into the analytic workflow and its permutations to facilitate further automation or process changes. These automation enhancements will be running in the background, available around the clock and targeted to specific triggers, events or data maintenance activities.

Upstream processing, a subset of end-to-end process automation, will involve the technical processing of source data and information in ways that replace or enhance the manual activities of analysis or production. These capabilities will allow us to shift the emphasis of our internal resources from foundation data production to analysis. In many cases, analysts will be cued to areas of change, decreasing analytic uncertainty in the future source-rich environment. Examples of upstream processing include automated or assisted change detection, target prioritization, geopositioning, geographic feature extraction, two- and three-dimensional model building, the generation of elevation data, and orthorectification, which involves correcting distance distortions in aerial photos caused by uneven terrain.

Tools such as these will free NGA personnel to focus on their specializations and more effectively apply the right combination of analytical, source management, technical and customer expertise to solve GEOINT problems. We will also leverage relationships throughout the community, drawing on diverse skills, backgrounds and expertise among customers, analysts, scientists, knowledge managers, and sensor and visualization experts. Contributors to GEOINT will encompass stakeholders from all levels of government, industry and academia across the world.



Hyperspectral imagery, used to identify materials, detect vegetative change and assess battle damage, is one form of Advanced Geospatial Intelligence (AGI). In the future, new technologies, sensors, tools and methods will pave the way for dramatic advances in the discipline of GEOINT.

In 2010, collaboration will be the norm, particularly between intelligence disciplines. GEOINT analysis will continue to be applied across regional and global issues. However, the analytic environment will be more complex, with dynamic customer intelligence needs for myriad missions, shortened response timelines, and dramatically increased availability of relevant multi-intelligence source information.

Analysts will fuse multiple sources of information to provide greater analytic insight. They will use national security community interoperable collaboration tools, exploitation devices, and reporting standards to enable information sharing. A robust softcopy environment, Web portal access, data discovery, and information architecture enhancements will facilitate communication, while other intelligence producers and consumers become our partners in GEOINT.

Through integrated operations, we will continue to improve our GEOINT content and services to best meet our customers' needs. We will integrate our processes to achieve effective, efficient operations. We will seek out and apply new sources of GEOINT to fill key knowledge gaps, and we will share our knowledge in a collaborative environment. We will further advance our source management capabilities, increase the depth of our analytic expertise, and deliver and maintain a robust technical environment. We will enhance our readiness and responsiveness to deliver GEOINT content and services that enable the mission success of our customers and partners.

The 2010 vision for GEOINT is sizeable, and achieving many capabilities will require significant investment. We realize there are both fiscal constraints and operational realities, which may impact the rate at which we can achieve our vision. Clearly, careful and well-informed decisions need to be made to best apply the resources we have to bring the vision to reality. Already we have begun to apply the elements of integrated operations to key investment and operational areas, including those for new sensors and space planning. But for GEOINT to achieve its promise, integrated operations will become the way we do business; it will become the tool that enables best decisions, best action and the best GEOINT value to our customers.

Office Protects, Prepares and Supports NGA People Worldwide, from Deployers to Vacationers

By Susan Allersmeyer

"Deployed and externally assigned employees remain an integral part of the overall NGA organization. They need someone to help maintain reach-back capability to the mother ship," says Steve Gonzales, Director of NGA's Office of Global Support (OGS). The office was formerly known as the Office of Deployed and Externally Assigned Personnel.

"We changed our name to more accurately reflect our mission—supporting our employees wherever they are," Gonzales said.

From communications connectivity to payroll issues, OGS is NGA's ombudsman for externally assigned employees. OGS account managers provide "one-stop shopping" for all external employee needs.

OGS tracks the travel of all NGA employees outside the continental United States, whether for temporary duty or vacation.

The intent of NGA's Director, retired Air Force Lt. Gen. James R. Clapper, is to protect the entire work force and to be fully accountable for them, said a senior staff member of OGS. "Today's environment makes this effort a critical part of our overall support mission."

OGS has developed a Web-based system where employees can find all the forms they need and other travel-related information. The safety, security and accountability of NGA employees overseas are a team effort, however. From travelers and their supervisors through the Security Office, many people and organizations play an important role in making international travel a success. Whatever, the threat level, TravelNet provides a common operating picture to best prepare and respond to events.

Deployed personnel show Army Maj. Gen. James D. Thurman (second from right) a printout of the latest geospatial intelligence during Operation Iraqi Freedom. NGA's newly renamed Office of Global Support prepares deployed personnel before they go on assignment and provides "reach-back" support while they are on assignment.

NGA's worldwide customers tell deployers on a daily basis just how important they are to the mission, say OGS officials. The Office prepares deployers for their assignments with training and equipment. This may include land mine awareness and hostage avoidance, as well as equipping them with body armor and other "gear" that literally outweighs them. After they are in theater, OGS uses deployable operating systems to speak on a routine basis to employees in forward operating areas.

Global Support staff were impressed with the quantity and quality of applicants who responded to a recent announcement for the volunteer deployment program. Not only do deployers receive a substantial financial incentive, they get unique opportunities to enhance their technical skills, broaden their careers and gain experience the standard office environment can't match.

The Office of Global Support truly epitomizes NGA's mission of providing timely, relevant and accurate geospatial intelligence to the war fighter and senior policy decision makers. OGS serves as yet another example of how NGA is looking "outside the box" to provide direct intelligence support globally at all levels of operation, whether it is strategic, operational or tactical.

Tom Cooke contributed to this article.

Susan Allersmeyer is Communication Executive for the Office of Global Support. Among other duties, she edits the OGS Flagpole, a newsletter for NGA's deployed and externally assigned employees.

Transformation Is Here—Portal Opens on World of GEOINT

By Air Force Capt. Dan Ward

NGA's transformation is coming to desktops across the Geospatial Intelligence (GEOINT) community.

In the transformation's first giant step, the new NGA Portal facilitates a dramatic change in the way NGA will do its GEOINT mission in support of the Intelligence Community (IC), Department of Defense (DoD) and Department of Homeland Security.

The Portal brings the Internet experience to the NGA workplace via Web browsers, without the need of any additional hardware or software.

Both simple and powerful, the Portal can be personalized according to a user's preferences. No matter where in the world they sign on, their tailored version will always be the same. It also gives users new capabilities to discover data and share data, and collaborate. Portal users have access to

- **Imagery and data**, including holdings of NGA partners in the IC
- **Services**, including NGA source management, analysis, data exploitation and targeting
- **Expertise:** the virtual presence of NGA and other experts across the IC
- **Collaboration opportunities:** virtual connections to personnel from multiple agencies and organizations on various networks, with chat rooms, file sharing, interactive white boards and the like.

The Portal helps users simplify searches, find previously inaccessible data and improve productivity. They will be able to spend significantly more time accomplishing the mission and less time trying to figure out how to get to the resources required to accomplish their mission.

A developmental portal parallels the operational portal, allowing users to try out new services and functionality before a decision is made to implement those features in the operational Portal.

The NGA Portal was used operationally—on a moment's notice—when NGA personnel deployed to Haiti last March. According to NGA's Office of Global Support, it became a critical component of their support operations, establishing new operational capabilities they will continue to use. The Portal is also assisting other national security missions, both at home and abroad.

The bottom line is that the faster and easier its people can work and get their information to those who need it, the better NGA is able to meet the growing demands of its customers. That's what the NGA transformation is all about.

NGA Deputy Technical Executive Michele Weslander, NGA Associate Director of the Acquisition Systems Office Lisa Spuria and Air Force Capt. Christopher Quaid contributed information to this article.

About the Author

Air Force Capt. Dan Ward has served in NGA's Acquisition and InnoVision Directorates since his assignment to the Agency in 2001. Since June 2003 he has helped spearhead the Portal development. He came to NGA from the Electronics Systems Center at Hanscom Air Force Base, Mass., and is transferring to the Air Force Research Lab in Rome, N.Y., this September.

Photo by Louis Halbert

The NGA Portal became a critical component of support operations when NGA personnel deployed to Haiti last March.

Photo by Rob Cox

Air Force Capt. Christopher Quaid demonstrates the new NGA Portal for NGA Director retired Air Force Lt. Gen. James R. Clapper Jr. The first major deliverable of NGA's transformation, the Portal gives users new capabilities to discover and share data.

Your Future as an Analyst

Imagine you are an analyst some time in the future. Let's say, for example, your job is to help predict when and where a certain less-than-neighborly nation will attempt to infiltrate agents into an allied country using a mini-submarine. Part of the job involves monitoring certain naval bases—keeping track of which infiltration vessels are in port each day and which appear to be under way.

But rather than searching through this online imagery server or that message queue, you log into the NGA Portal. The portal gives you access—at the appropriate security level according to your user profile—to the Geospatial Intelligence Knowledge Base (GKB).

An image of the Earth appears on your GKB screen and zooms in to show the East Coast of the unsociable nation in question. With a click of your mouse, the model shows the location of East Coast ports and depicts which submarines were last observed in port and which were missing. With a few more clicks you see overlays of various forms of data and information.

Now your ability as an analyst comes into play.

Wonder if there are high seas off the coast? Are conditions amenable to submarine training? With another click you call up the weather chart for the area, and it overlays on the screen. You click again to call up a layer depicting submarine operating areas and shallow zones.

Wonder if there is a recent written report—from open sources or human intelligence—about naval training in the area? Simply click to call up written products that pertain to activity in the boxed area on your GKB screen.

All this—imagery, orders of battle, weather, nautical information, written reports—in just a few clicks. The preparatory, sometimes tedious, work has been done. It's all in the same place, accessible through a single visual depiction of the operating area you care about.

Now you can focus on thinking about what it all means. You can focus on analysis.

This is the vision of the GKB. It will provide a layered model of the Earth with options to see, on demand, a specific area of interest in imagery, terrain elevation data, or some combination thereof. Intelligence would filter into the model—features, activities or objects in their place—to show instantly what is where on the Earth.

--Excerpted from DMail, the Director's message to the work force

Taking a Good Look—With UAVs, GEOINT Gains Power

By Darryl Garrett

Unmanned aerial vehicles are an essential part in the process of how NGA develops and produces geospatial intelligence (GEOINT) today. While NGA does not own or manage any UAV flights, the Agency does use airborne imagery from various UAV platforms to accomplish its mission.

Besides providing an additional source of imagery, UAVs make possible persistent surveillance—the capability to monitor any area of the Earth for a constant 24 hours or more.

UAVs were used for surveillance in Operation Desert Storm.

In Kosovo, a medium-altitude UAV developed by the Air Force collected intelligence, searched for targets, monitored refugee movements and assisted planners in their assessment of the situation on the battlefield.

In Afghanistan, Predator-Bs, outfitted with Hellfire missiles, provided quick reaction to targets of opportunity. In Yemen, a Predator with missiles killed six terrorists in November 2002.

UAV capabilities

The Predator operates at around 26,000 feet altitude and can stay aloft for 40 hours. If it has to fly 500 nautical miles from where it takes off, it still has enough fuel to loiter 24 hours. It normally carries an infrared/electro-optical payload in a gimbaled ball and a Synthetic Aperture Radar (SAR) system. The SAR processes the aircraft's movement between radar pulses, creating a synthetic aperture that gives detailed results like those obtained with a large antenna. It can sense remotely day and night in nearly all types of weather. Primarily used for surveillance, the Predator has been outfitted with AGM-114 Hellfire air-to-ground missiles under each wing.

While the Predator flies at medium altitude with primarily tactically focused sensors, the largest operational UAV—Global Hawk—flies at altitudes of 65,000 feet—nearly twice as high as commercial airliners. Operational since early 2002, it can stay aloft, covering an area as large the state of Illinois for 24 hours, providing near-real-time imagery.

U.S. Navy photo by Petty Officer 3rd Class Jeffrey S. Viano

On a runway at San Nicholas Island, California, a Predator is prepared for a practice mission with a carrier battle group—a first for the unmanned aerial vehicle in this 1995 photo.

The Global Hawk carries an internal payload that is much larger than the Predator. Its suite of sensors includes infrared/electro-optical sensors for high-resolution digital images and an all-weather SAR with Moving Target Indicator. An MTI is designed to show only moving targets in a radar's return signal.

Advantages/Limitations of UAVs

UAVs have several attractive attributes for intelligence, surveillance and reconnaissance (ISR). Because their surveillance is persistent, adversaries are denied the capability to hide their activities. By contrast, satellites can only revisit areas on predictable schedules, making it easier for adversaries to conceal and deny their activities.

UAVs are also a cost-effective alternative for some missions. Compared to a space-based system, they are cheaper and faster to replace if a sensor or subsystem fails. At the same time, UAVs provide a cost-effective way to test sensors and subsystems before they are placed in space.

UAVs obviously have some limitations. Current systems do not have the immediate global reach that satellites have: it takes time to move assets to a theater. They can suffer damage from bad weather or hostile ground fire. Current UAV systems do not provide the metadata in their data sets that could provide accurate target location for weapons that use geopositioning for guidance.

Improving UAVs

NGA is leading the transformation in airborne operations for GEOINT. The Persistent Surveillance Office in NGA's InnoVision Directorate is supporting several programs to improve UAV data-gathering capabilities:

Faster Targeting. The Gridlock Advanced Concept Technology Demonstration (ACTD) is designed

Courtesy of Northrop Grumman Corp. © 2003

A high-altitude, long-endurance reconnaissance system, the Global Hawk can survey large geographic areas with pinpoint accuracy.

to produce smart imagery by allowing UAV imagery to be registered to existing highly accurate positioning imagery—in this case NGA's Digital Point Positioning Database (DPPDB). The goal is to allow weapons to use UAV position data directly. If successful, Gridlock will provide position data accurate to within 10 meters and shorten the time elapsing from sensor detection to weapon launch (referred to as "sensor to shooter") to less than one minute.

Gridlock replaces current time-consuming manual imagery registration with an automated machine-to-machine process. The automated process will produce tactical images embedded with metadata so that the geopositioning accuracy of each pixel in the image approaches the absolute geopositioning accuracy of the reference DPPDB.

Gridlock will transmit actionable information to a display in the field that will show accurate coordinates and error estimates by moving a cursor over the image of interest. Gridlock will then export selected coordinates into targeting tools. This technique will minimize the need for training and improve sensor-to-shooter response time.

Sponsored by U.S. Central Command, Gridlock focuses on three ISR platforms used by the Air Force: the Predator, Global Hawk and the piloted U-2. The Air Force will transition technology developed by the Gridlock program to operational systems. Plans call for a proof of concept demonstration in August, with further development and demonstrations through 2006, including a final military utility assessment.

Higher-Resolution Elevation Data. The Interferometric Synthetic Aperture Radar (IFSAR) ACTD will develop the capability to collect high-resolution terrain information (HRTI) from high-altitude UAVs. IFSAR systems produce highly accurate topographic information by measuring the difference in interference patterns from two on-board antennas. HRTI is essential for current operations and will be a central part of the Geospatial Intelligence Knowledge Base that NGA is developing.

NGA's Digital Terrain Elevation Data (DTED®) is now available only at intervals of 90 to 30 meters (DTED® levels 1 to 2) for the globe as a whole. Precision engagement requires HRTI at 3- to 1-meter postings (DTED® levels 4 to 5).

Earlier demonstrations proved the feasibility of using airborne IFSAR to capture high-resolution DTED® for thousands of square kilometers. NGA's IFSAR mapping program will take that technology and implement it on a Predator-B UAV.

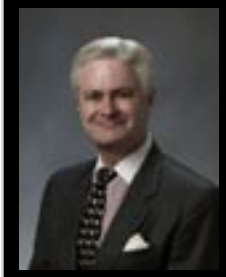
The program and technical manager for the ISFAR ACTD is the Army Joint Precision Strike Demonstration (JPSD). NGA is the deputy program and deputy technical manager. The U.S. Southern Command is the operations manager, and the Air Force is the transition manager. Following technical and operational demonstrations, transition to the U.S. Southern Command is planned for 2006.

Better Urban Reconnaissance. The Urban Reconnaissance ACTD, led by the Army's Joint Precision Strike Demonstration Office, will develop three high-resolution laser sensors and supporting field equipment to quickly generate three-dimensional databases of urban environments. One of the sensors will be an airborne sensor for integration into a small-scale UAV. There will also be man-portable and ground vehicle-mounted versions.

Continued on page 21

About the Author

A consultant to NGA, Darryl Garrett retired from the CIA and the National Imagery and Mapping Agency (NIMA), now NGA, in 2000. In 1996 he and Steve Wallach led the transition team that set up NIMA's first research and development program. He served as the Director of NIMA's Technology Office from 1996-2000. In 1994 he supported the first CIA UAV program over Bosnia.



NGA Turns to Commercial Imagery To Fill Demand for Unclassified GEOINT

By Jessica Warner

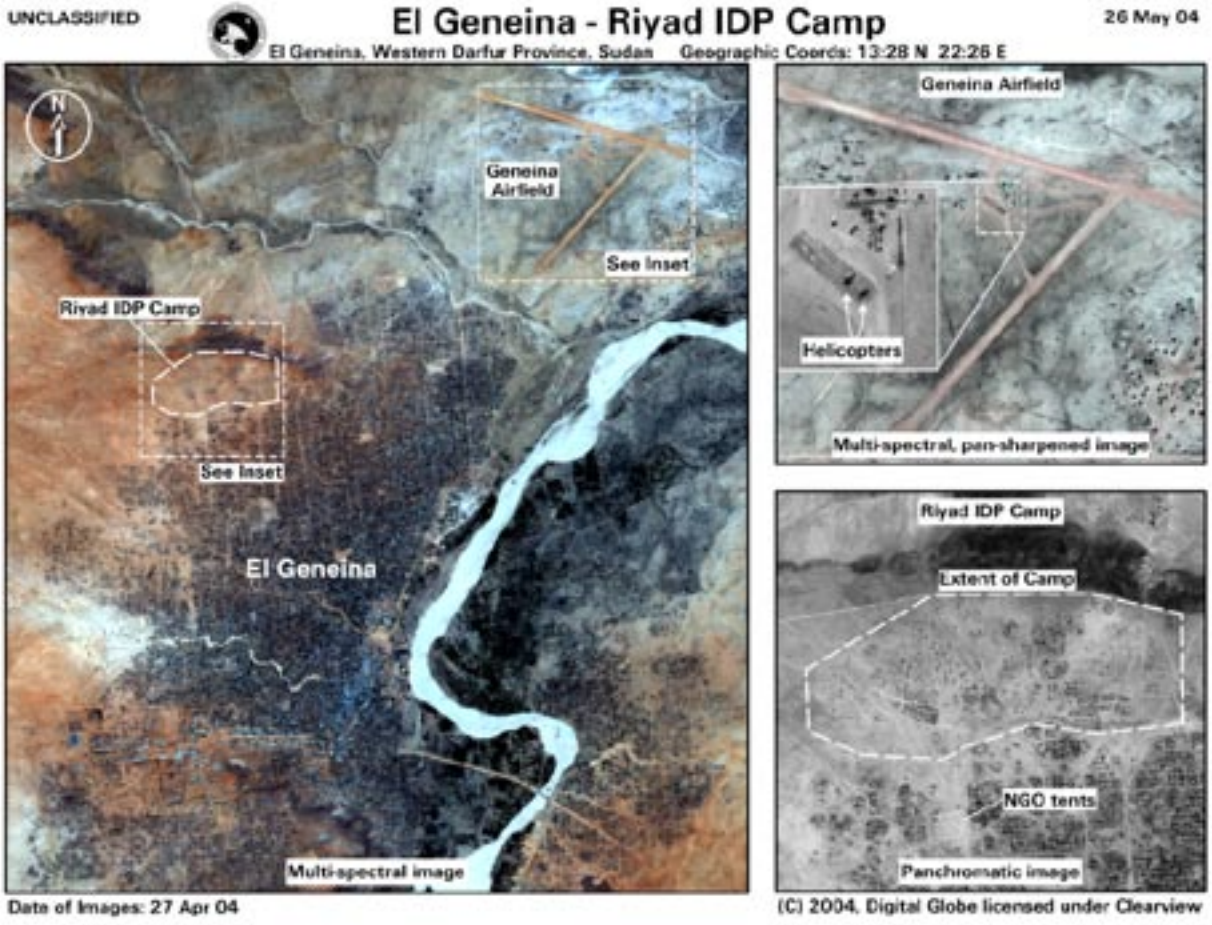
Commercial remote-sensing (CRS) products have emerged as an integral part of how NGA develops and produces GEOINT from the status of an auxiliary product just a few years ago. One of NGA's challenges is to answer a simple question—"How can we provide an imagery-based geospatial intelligence (GEOINT) solution that can be shared with the world?"

Increasingly, analysts are answering that question with CRS products. The unclassified nature of commercial imagery is critical to NGA's support to a variety of requirements.

NGA's vision for integrating CRS data and products into the National System for Geospatial-Intelligence (NSG) focuses on optimizing capabilities to exploit unprocessed sensor data, imagery, imagery services, imagery-derived products and imagery support data obtained from commercial sources.

Sudan Crisis

A clear example of this vision was support NGA provided to the United States in the Sudan crisis. Recognizing the need for an unclassified GEOINT briefing that could be ready at a moment's notice, NGA's Analysis and Production Directorate created slides from CRS to support senior administration officials dealing with the crisis. Initially, these slides were briefed to Andrew S. Natsios, the Administrator of the U.S. Agency for International Development (USAID). Natsios then briefed the slides to the international community in Geneva, Switzerland, to leverage funds and raise awareness of the situation in Sudan. These same products were also briefed to Senators Mike DeWine of Ohio and John McCain of Arizona. McCain was slated to use them for a briefing on the Senate floor. Secretary of State Colin Powell, U.N. Secretary-



NGA's Analysis and Production Directorate created slides from commercial remote-sensing products to support senior administration officials dealing with the crisis in Sudan. Officials used the slides to brief the international community, and they were later used in television programs. The unclassified nature of commercial imagery is critical to NGA's support to a variety of requirements.

General Kofi Annan, representatives from the five permanent members of the Security Council and U.N. the Ambassador of War Crimes, Pierre-Richard Prosper, received briefings using these products.

More recently, these images were used on the television programs "The News Hour with Jim Lehrer" and "This Week with George Stephanopoulos."

Several unclassified imagery-derived products have been produced from the Sudan CRS images, including graphics monitoring individually displaced persons and refugees, terrain elevation products, hydrographic products, and transportation studies.

Operations in Iraq

There has been repeated CRS coverage of Iraqi cities during the ongoing conflict. The coverage gives forces in theater an unclassified image base for GEOINT product development. For context, they also receive master cover trace, an image footprint from an entire aerial reconnaissance mission. To date, copies have been shared with the 82nd Airborne Division, the 1st Marine Expeditionary Force, the 5th Special Forces Group and NGA's Office of Global Support.

If necessary this unclassified imagery source can easily be shared with Coalition Forces. Imagery of the greater Baghdad area, Mosul, Balad and Tikrit has been shipped and is being updated when available; products covering An Najaf and Karbala are currently being added.

Force protection operations planning has been one use for this imagery, providing personnel in convoys with "Trip-Tiks." Debriefers and interrogators have also found this CRS coverage to be useful.

Unclassified commercial imagery of Iraq was used to provide pre-departure familiarization briefings for members of Congress and the Senate going to Iraq for various meetings.

CRS data of Jordan and sites in Saudi Arabia was also provided. Unclassified geospatial products of the entire Gaza Strip and portions of the West Bank have been provided in 2-meter resolution format to support monitoring efforts and resolution breach briefings.

Earth Reference Model

Along with the GEOINT products of analysts, NGA is developing an Earth Reference Model (ERM) as a solution to GEOINT questions. The model will have several layers including imagery, features like roads and boundaries, and elevation data.

The base imagery layer of the ERM will be a near-global, 1-meter-resolution imagery mosaic that will support a variety of GEOINT issues. The mosaic will be orthorectified, meaning that image displacement due to photographic tilt and relief will be eliminated.

NGA's Analysis and Production Directorate will populate the imagery layer with CRS data through a production strategy that integrates coproduction (done by foreign countries) and outsourcing (done under contract). Directorate officials believe that the costs and timelines for producing GEOINT products from the ERM will be less than those of current processes, which will allow NGA to respond more quickly to ever changing customer requirements.

Meanwhile, analysts are finding that, for requirements calling for unclassified GEOINT, commercial remote sensing products increasingly provide the best answer.

New Management Authority to Focus on CRS Imagery and Data

NGA Director retired Air Force Lt. Gen. James R. Clapper Jr. has established a Commercial Remote Sensing Management Authority (CRSMA) to manage the Agency's strategy for integrating commercial remote sensing (CRS) into existing programs of the National System for Geospatial-Intelligence (NSG). The CRSMA will support the development of the community of CRS imagery and data exploiters into a larger national capacity to meet the needs of the Intelligence Community and Department of Defense as well as civil needs.

The CRSMA's primary function is to manage NGA's strategy for integrating CRS into existing NSG programs and systems based on customer requirements, mission needs, external direction, business drivers and NGA senior-level guidance. The CRSMA provides a forum to facilitate planning, oversight, and evaluation of implementation actions required to build an integrated, enterprise-wide capability.

Integration of CRS processes into the NSG involves coordination with nearly the full spectrum of NGA Key Components and individual project managers to ensure coordinated

- *strategy development and oversight and evaluation of implementation actions*
- *policy development and implementation*
- *business planning, program, process and resource accountability*
- *budget execution*
- *interface with DoD, IC, foreign, civil-agency and commercial-industry partners.*

About the Author

Jessica Warner is a Booz Allen Hamilton contractor supporting the Commercial Remote Sensing Integration Team in NGA's Directorate of Analysis and Production as a commercial imagery representative. She began her career as a geospatial analyst at the National Imagery and Mapping Agency, now NGA, working in the Pentagon GeoCell and in the Eurasia/Africa branch.

Coproduction Tackles the Globe—
Multinational Effort Enhances Fulfillment of NGA Mission

By Marzio Dellagnello

NGA shares the production of geospatial data and products with many nations. Coproduction—whether for planning or operations, in peacetime or during crises—has many advantages.

Besides minimizing duplication of effort and its associated costs, coproduction allows NGA to concentrate on its mission. Analysts are free to concentrate on providing actionable geospatial intelligence (GEOINT) to customers from the foxhole to the Oval Office, rather than getting mired in making purpose-built standard products. At the same time, coproduction promotes cooperation among nations and—even more important—interoperability when a situation calls for combined action. Data and products produced through the coproduction also may have fewer release restrictions, which allows wider use by coalition partners and others, such as the International Red Cross.

In one of the most successful coproduction initiatives, the VMap Coproduction Working Group, will soon achieve near-global coverage of digital vector data at the scale of 1:250,000. Nineteen nations were involved in the 10-year initiative, producing medium-resolution digital vector data (VMap, Level 1). Vector data are digitized points, lines and polygons used to represent features on Earth, from roads to rivers. VMap content, including that digitized through coproduction, has been used to initialize NGA's Geospatial Intelligence Feature Database, hosted on the Web-based NGA Gateway.

As part of its readiness/responsiveness strategy to meet customer requirements, NGA is striving for worldwide coverage of geospatial data at a higher resolution. However, due to the sheer volume of the job, in-house and contract producers cannot produce all the critical areas, particularly with vector feature content. It will take help from multinational coproducers to achieve the goal.

Through a Multinational Geospatial Coproduction Program (MGCP), NGA is now building a unified global production plan to achieve the goal of worldwide coverage of higher-resolution vector feature data.

The MGCP "is a significant step to expand unified operations in today's multilateral environment," says Jack Hild, Director of NGA's Federated Operations Office. "The geospatial industry has seen incredible growth over the last five years, and each participating nation brings 21st century capabilities to the group."

The basis for the MGCP will be a multinational Memorandum of Understanding (MOU), presently being negotiated by NGA's International and Policy Office on behalf of the Director, NGA. The MOU will provide for standardized collection of geospatial features and coordination of national production strategies. A working committee has been drafting an MOU for signature by participating nations. Some 20 nations are expected to participate in the program.

Last November a plenary group met in Reston, Va., to establish production guidelines. Since January a steering committee has been meeting to determine the production responsibilities of the participants and a technical group has been meeting to develop standards for the project.

The production plan now in development calls for concentration on high-interest areas worldwide and areas where high-resolution vector data currently does not exist. The feature density of the products will correspond to the 1:50,000 or 1:100,000 scales, depending on the

Major Roman Kováik of the Topographic Institute in the Slovak Republic welcomes NATO/Partners for Peace counterparts to a mapping, charting and geodesy workshop in Banksá Bystrica last October. Multinational meetings of this type are extremely valuable to the Multinational Geospatial Coproduction Program.

area, with the production to be divided into one-degree-square cells. A one-degree-square cell is 3,600 square nautical miles at the equator (diminishing slightly in size moving away from the equator).

Data produced by the MGCP will reside in an International Geospatial Warehouse (IGW) developed and funded by NGA. Participating nations will have access through a portal on the World Wide Web.

Initially, flat files will be the exchange format, but plans call for a relational database that will allow manipulation of the data, such as updates, in a second phase of the project.

The IGW will bring about dramatic improvements in communication among the participating nations. By providing a common holding area and exchange mechanism, the IGW will enable rapid exchanges of data on an unclassified but protected site, with the Web providing the common denominator of interoperability.

About the Author

Marzio Dellagnello chairs the Multinational Geospatial Coproduction Program (MGCP) plenary group. He is a lead geospatial intelligence analyst in the International Coproduction Branch of NGA's Eurasia-Africa Geospatial Division. Born in Bolzano, Italy, Dellagnello came to the Defense Mapping Agency, a predecessor of NGA, from private industry in 1989.

NGA Director Shares Vision Abroad, Signs Bilateral Agreement with Latvia

NGA's Statement of Strategic Intent calls for "expanding the number of NGA partners to help execute our mission and achieve our vision." In May, NGA set out to accomplish just that by co-hosting a two-day conference that brought together over 140 participants from 18 NATO and Partnership for Peace (PfP) countries.

NGA and the Ministry of Defense of the Republic of Latvia jointly co-hosted the third annual NATO and Partnership for Peace (PfP) Geospatial Symposium and Technology Exposition in Riga, Latvia May 18-19. NGA Director retired Air Force Lt. Gen. James R. Clapper Jr. and the State Secretary of Latvia's Ministry of Defense, Edgars Rinkevics, also signed a bilateral agreement between the two organizations.

Throughout the symposium, the common thread of achieving interoperability among geospatial systems was identified as a critical need in improving the success of international peacekeeping efforts.

Both old and new NATO nations and PfP members used the symposium to improve and strengthen their relationships within the geospatial community, advance their understanding of many of the latest geospatial technologies, expand existing bilateral cooperation and initiate new, mutually beneficial relationships.

NGA personnel presented six of the symposium's 27 briefings; five were by U.S. and Latvian commercial vendors.

NGA Director retired Air Force Lt. Gen. James R. Clapper Jr., right, meets with the Commander of the Latvian National Armed Forces, Vice Admiral Gaidis Andrejis Zeibots, during a NATO/Partners for Peace Geospatial Symposium in Latvia earlier this year.

In opening remarks, Rinkevics said that sharing standardized geospatial information and data is critical to fighting the global war on terrorism, adding that NATO/PfP collaboration is key to the future. The U.S. ambassador to Latvia, Brian E. Carlson, noted that Latvia, as a new member of NATO, is likely more secure now than at any time in its history. Interoperable standards serve the mutual defensive strategies of all the partner nations, he said.

Clapper said geospatial intelligence (GEOINT) is a key component for developing common operational pictures that decision makers and commanders at all levels use in making informed decisions. GEOINT has a tremendous potential for improving coalition operations, supporting peacekeeping initiatives, assisting efforts to monitor treaties, improving homeland security and conducting humanitarian missions, he said.

Clapper encouraged all new NATO partners that are currently not participating in bilateral agreements with the United States to listen to the presentations from those partners at the symposium that do have such agreements. NGA is committed to increasing the Agency's collaboration and sharing of the production burden with its allies, he added.

This year's symposium was the first to be held after the enlargement of NATO March 29 when Latvia and six other PfP countries officially became new members. All but one have signed bilateral agreements with NGA.

New NGA Center Promotes Interoperability

By Denise Perreca

Geospatial intelligence (GEOINT) comes in many forms. Its sources are growing. Its customers are spread across countless time zones. Its makers reside within numerous intelligence entities and federal departments, not to mention each of the military services.

Who's to say one person's GEOINT will look like another's? Who's to say the growing array of GEOINT data, products and services will be even remotely compatible?

The National Center for Geospatial Intelligence Standards (NCGIS)—that's who.

Operational since Oct. 1, 2003, the Center is charged with identifying, advocating and promulgating geospatial intelligence standards and putting in place management processes and policies to promote interoperability and operational efficiency across the National System for Geospatial-Intelligence (NSG).

NGA Director retired Air Force Lt. Gen. James R. Clapper Jr. authorized the establishment of the Center to meet his responsibilities as functional manager for GEOINT and to support a standards-based approach to transformation of the NSG enterprise architecture. The Center will fulfill the responsibilities described in Department of Defense Directive 5105.60: to prescribe and mandate standards for imagery, imagery intelligence, and geospatial information for all DoD components and the Intelligence Community.

A Community Effort

The Center acts as the focal point for the management of GEOINT standards activities for both the NGA and NSG community. "The NCGIS is the vehicle to partner with the Community and make interoperability not only a goal, but a reality," said Karen Irby, Director of the NCGIS.

The Center is leading the formation of a new community-wide GEOINT standards working group. It will operate under the umbrella of the Defense Information Systems Agency (DISA) Information Technology Standards Committee (ITSC) and provide a forum for community discussions and decisions on GEOINT standards. These will be included in the DoD Information Technology Standards and Profiles Registry—formerly known as the Joint Technical Architecture.

Examples of GEOINT Standards

Community-wide GEOINT standards will govern such things as the archival, discovery, retrieval and exploitation of GEOINT, enhancing information sharing and collaboration among geographically dispersed users from various intelligence disciplines. Here are some examples of areas that will fall under Center-established standards:

- Geospatial Intelligence Metadata
- Information Transfer
- Imagery Content and Format
- Geographic Feature Portrayal
- Geographic Feature Encoding
- Geospatial Intelligence Reporting
- Geospatial Reference
- Data Compression

Transforming Standards

The Center is "doing standards" in a new way. It is working closely with enterprise architecture and development teams to ensure use of GEOINT standards that support commercial off-the-shelf solutions. The intent is to move the Agency to a data- and net-centric environment using the best technology that industry has to offer. The NCGIS will adopt and implement standards in a way that aligns with existing internal governance, acquisition and requirements processes.

Representing the NSG Community

As the champion of GEOINT standards, the Center participates in appropriate government and industry forums and other standards development and advocacy activities, both national and international.

Such forums include the International Organization of Standardization and the American National Standards Institute. NCGIS standards experts were instrumental in developing the ISO metadata standard, which will be the basis of future metadata profiles. The Center also supports NATO partners through the Digital Geographic Information Working Group and federal civil agency partners through the Federal Geographic Data Committee (FGDC). NCGIS personnel are currently working with the FGDC Homeland Security Working Group to develop

symbology standards for emergency management.

The Center is also involved with the Joint Interoperability Test and Evaluation Center and is helping in the ongoing evolution of the National Imagery Transmission Format standards for still imagery. In addition, the NCGIS works with ongoing standardization efforts in geographic information systems and related industries to ensure that emerging industry standards and technical solutions support the full range of GEOINT standardization requirements.

Representing NSG requirements and forging partnerships through these and other forums is critical to ensuring the use of standards that will enable the sharing of timely, relevant and accurate geospatial intelligence. Sharing GEOINT in a networked environment is necessary to fully support the war fighter, the Intelligence Community, U.S. coalition partners and civil agency customers.

Standards for the Future

Standards do not live on forever. As appropriate, they will be sunsetted at the end of their lifecycle. Over time the NCGIS will recognize emerging standards. For maximum interoperability, the focus will be on an open, consensus-based process that keeps pace with new technologies.

To meet these challenges and serve the NSG community, the Center is building a standards organization composed of NGA professionals who will work with other subject matter experts across the NSG. Together they will ensure that GEOINT standards do indeed live up to the motto adopted by the NCGIS: Standards: the Foundation for Interoperability.

NCGIS personnel are located in Chantilly, Va., and St. Louis. For more information, visit the NCGIS web site at www.nga.mil (select Products and Services/Standards). Or send an e-mail to ncgis-mail@ncgis.mil.

About the Author

Denise Perreca recently retired from NGA as a staff officer in the NCGIS. She currently works for Northrop Grumman/TASC and supports GEOINT standards activities through the Enterprise Engineering contract.

WHAT'S ON YOUR MIND?

Survey Looks for Ways to do GEOINT Better

How can we do geospatial intelligence better? That was the thought behind NGA Survey 2004, which the Director, retired Air Force Lt. Gen. James R. Clapper Jr., introduced with a reference to his Pathfinder column, "On My Mind."

"Now I want to know what's on your mind," he wrote in the e-mail addressed to the entire work force—government and contractor—when he asked them to take the survey.

Since the last work force survey, conducted in 1999, "favorable responses" increased in every category where a comparison was possible, including "customer orientation," "job satisfaction," "work environment" and "leadership." On the other hand, employees who identified themselves in certain occupations (such as cartographers) expressed frustration over how they perceived their careers were progressing.

Compared to other government agencies, the 2004 survey results showed that NGA does best in the area of "training and development." NGA employees identified their "working environment" as not up to par with their colleagues in other government agencies.

Five categories received favorable responses of 75 percent or better. In the category, "One Agency Focus," 80 percent of employees agreed that management encourages them to work across Directorates, 79 percent rated the Agency's "Customer Orientation" favorably in responding to questions on this topic, and 77 percent agreed that managers recognize and respect the value of human diversity. "Job Satisfaction" was close behind at 76 percent.

Six categories received favorable responses of 60 percent or below. Although employees saw "Employment Uncertainty" as less of an issue by 21 percentage points, compared to 1999, only 60 percent looked favorably on their employment prospects. "Working Relationships/Teamwork" rated favorably with 56 percent of employees, 55 percent rated their "Performance Management" favorably" and 54 percent rated their "Working Environment" favorably. "NGA Leadership" was rated 21 percentage points higher than in 1999, but only 49 percent responded favorably. "Organization Change," the lowest rated category with a 37 percent favorable response, was a new category, with the responses indicating significant differences among employees about the Agency's operations, culture, goals and objectives. The Agency was created from elements of the Defense Department and Intelligence Community in 1996.

NGA's Human Development Directorate (HD) is continuing to analyze the massive amount of detail contained in the survey and will make recommendations for "a way forward," Clapper announced. "HD will conduct a series of focus groups and interviews with relevant stakeholders to gain greater insight into your responses and their implications," he added.

The Director promised to get back to the work force by the end of September after the survey results have been analyzed in more detail. He also announced his intention to involve the work force in finding solutions to the problems that "can be fixed" and to make NGA the "employer of choice within the Intelligence Community, if not the entire government."

Another survey will be taken in 2005 in a continuing effort to monitor the Agency's progress as it strives to do GEOINT better.

—Paul Hurlburt

GeoSAR Project Unveils Colombia

NGA Partners with EarthData to support U.S. Southern Command

By Tom Harrington

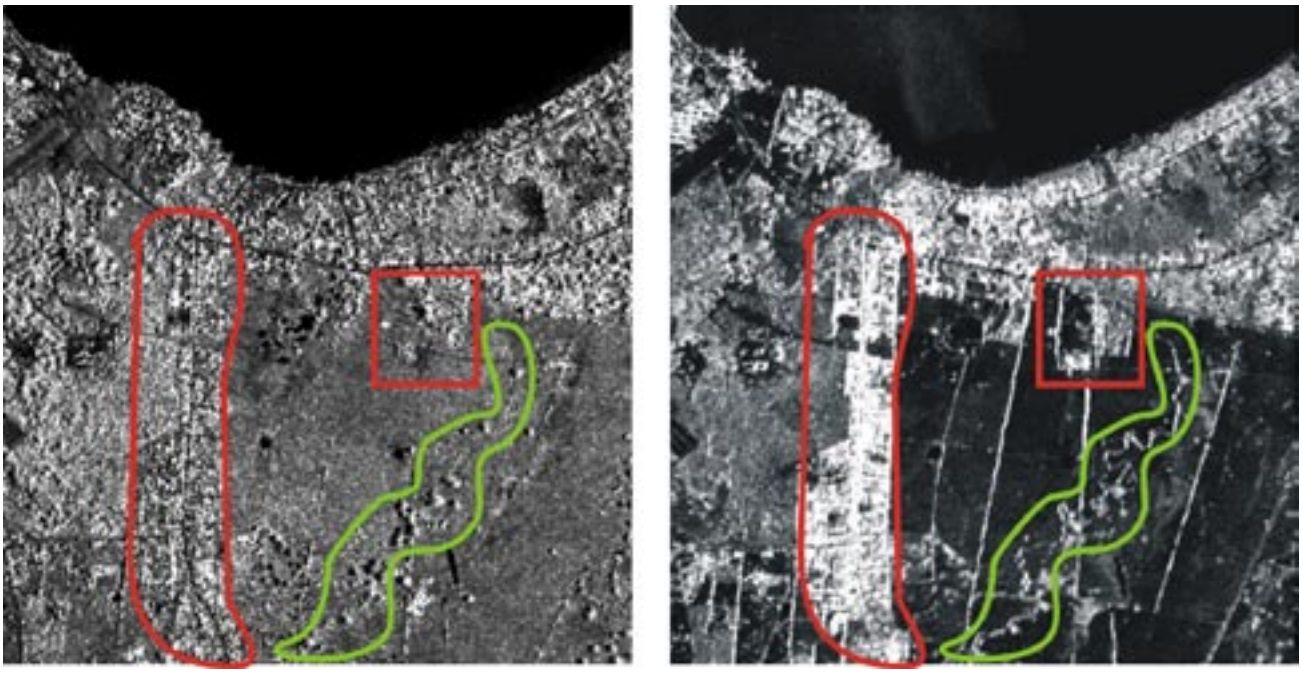
NGA has contracted with EarthData International (EarthData) to support initiatives of the U.S. Southern Command. EarthData was a partner of the government/commercial venture that developed GeoSAR, the airborne dual-band radar mapping system that can penetrate foliage and provide previously unobtainable views. NGA managed the third and final phase of the nine-year GeoSAR development program.

The objective of the GeoSAR Latin American Demonstration Project (GLAD-P)—GeoSAR's first commercial project for NGA—was to map previously inaccessible areas around the Cano-Limon pipeline in Colombia. Subsequently, the NGA broadened the scope of its effort to map similar regions in the country through an initiative called Nexus. There is great interest in improving map information gaps related to manmade features and transportation networks obscured by triple-canopy forest and cloud cover.

GeoSAR

Mounted on EarthData's Gulfstream II jet, GeoSAR maps the Earth at a rate of 160 square kilometers per minute from an altitude of 10,000 meters above mean terrain. GeoSAR is highly efficient for mapping large areas, and because it is a radar system, it collects data day or night regardless of cloud cover. The system includes two X-band antennas, mounted near the Gulfstream's fuselage, and two P-band antennas, mounted at the aircraft's wing tips. The twin antennas simultaneously collect data from multiple and opposite angles over two ground swaths, each 10 kilometers wide and up to 200 kilometers long, at a rate of a gigabit per second. The sheer volume of data provides detailed surface information, while the redundant collection inherent in overlapping flight lines minimizes data voids.

The system's capability for dual simultaneous X- and P-band data collection in a single pass over each flight line is unique. The 3-centimeter-wavelength X-band frequency reflects off the vegetation and other surfaces, providing 3-meter resolution for first-surface features. Complementing the X-band data, the 85-centimeter-wavelength P-band frequency penetrates vegetation and reflects off substructure, showing at a 5-meter resolution for natural and cultural surface features hidden beneath foliage. This feature makes GeoSAR suitable for regions like Columbia where project areas are inaccessible to ground crews and invisible to conventional mapping systems. Moreover, radar collection



Photos courtesy of EarthData Aviation LLC

Surface features covered in the X band image, left, are visible in the P band image at right. For spatial accuracy, GeoSAR uses both frequencies simultaneously in a single pass.

greatly increases the collection opportunities that are limited to visible imagery collection due to weather. This spatially accurate system fills a void that no other system offers.

Photos courtesy of EarthData Aviation LLC

A Gulfstream II jet flew a GeoSAR dual-band radar mapping system in a project over Colombia. The system captured previously unseen cultural surface features that were hidden by triple-canopy forest and cloud cover.

GLAD-P

The 93,758 square-kilometer GeoSar Latin America Demonstration Project (GLAD-P) area extends through the coastal plains to the Andes Mountains and from urban settings to triple-canopy jungle. The extreme terrain and ground-security concerns make flight planning along the Cano-Limon pipeline a major challenge.

Colombian civil and military agencies assisted with in-country logistics support, such as security, while NGA and other U.S. civilian and military agency partners assisted with mission coordination, frequency use and airspace clearances.

There are distinct differences between X- and P-band data. X-band data reveals texture variations that support vegetation and other characterizations. P-band data reveals substructure hidden beneath canopy: man-made features such as buildings and fences, and drainage. Roads and cultural features that disappear in forested areas become visible on the P-band imagery. Updated with this information, a map becomes a better tool for mission planning and force protection.

Coverage of the expansive area of GLAD-P required 187 flight lines, each about 120 miles long. The GLAD-P mission acquired 22TB of data, which will produce X- and P-band Digital Elevation Models and orthorectified reflectance images of this previously unmapped area. In addition, the data can support derivative products such as high-resolution, single-look (slant-plane) imagery; variations suitable for terrain modeling, imagery analysis, and derived imagery products; reports for applications such as multi-intelligence fusion; as well as verification and validation of other imagery sources and methods.

Nexus and Beyond

Building on experience from GLAD-P, the EarthData GeoSAR crew returned for a second deployment to Colombia, this time to Cali, on May 28, 2004. Crewmembers successfully completed the acquisition phase of Nexus—a mapping project in the southern part of the country that required additional and rigorous security precautions.

Mark Schultz, NGA's Director of Corporate Relations, expressed the Agency's appreciation for the team's effort.

"We certainly are aware of the risks that all of you take with us and for us," Schultz said. "This truly is an American team we have put together, great Americans working together for our common good."

EarthData is proud to have partnered on this critical NGA-led effort.

Although GeoSAR has only been operational for a short period of time, with each mission, the real capability of the system continues to be demonstrated. In its fleet of aircraft, EarthData considers GeoSAR a "national asset." EarthData stands ready to respond to the nation's next call.

A retired Air Force colonel, Tom Harrington is president and general manager EarthData Aviation LLC, Hagerstown, Md.

The opinions expressed by the author do not necessarily reflect the views of the NGA. Publication of this article is not intended to express or imply an endorsement of the author or the company.

Rotations are Key Link to NGA Mission

By Mary Dierker

At NGA, rotational assignments play a significant role in developing leadership and providing a collaborative exchange for sharing information vital to the Intelligence Community and the nation.

The National System for Geospatial-Intelligence (NSG) Statement of Strategic Intent—the capstone document that sets the future direction of the Geospatial Intelligence (GEOINT) discipline—calls upon NGA and its NSG partners to "prepare a leadership team for the future of GEOINT."

"As you know, GEOINT is an overarching discipline encompassing several once-distinct tradecrafts," NGA Director retired Air Force Lt. Gen. James R. Clapper Jr. said in an e-mail to the work force. "To be successful, our work force needs to understand the full scope of what the Agency is about. This understanding is often achieved through experiential learning that comes from a variety of assignments."

According to the Director, "Periodic rotations prepare our managers for increased responsibility in the larger Intelligence Community. NGA is nurturing the next generation of leaders who will need to think and act beyond the bounds of the Agency. Just as military personnel prepare for increased responsibility by taking on a variety of assignments, so must we in the Intelligence Community."

The Agency's organizational components also need to work together, Clapper said, and rotations enhance teamwork.

"I want managers vested not just in the success of their own organization, but in the success of NGA as a corporate whole," he said.

Photo by Kerry Gilbert

Kim Robson, an executive in NGA's Acquisition Directorate, second from right, sees her rotation with the InnoVision Directorate as way to "understand the broader scope of the problems we are trying to solve as an Agency."

National Geospatial-Intelligence College Director Sam Birchett believes a major way of providing greater insight and effectivity into the NGA mission—from the Agency level all the way down to individual offices—is to visualize it in relation to the capabilities of our many partners across the Intelligence Community.

"One way to garner a true appreciation of those capabilities is through working relationships that we gain with rotational assignments, seeing people in their environment and having them see us in ours," Birchett said.

Rotations within NGA

- *Informal rotations are arranged between managers via a Memorandum of Understanding.*
- *Formal rotations are announced in the Human Development Directorate's Assignment Opportunities Notice.*
- *Assignments typically last from 3 months to 2 years.*

Looking back on a rotation to the Air Force Materiel Command, Gary Hacker, Director, Office of Advanced Geospatial-Intelligence, said he expected to contribute his expertise in geospatial information to the accuracy of weapons systems.

"I ended up learning how much these weapon-system programs figure into national policy-making, how, for example, foreign military sales are both a deterrent to aggression and a business imperative," he said. "Above all, my experience allowed me to visualize the impact of decisions beyond the obvious or primary intentions." He returned from his rotation as "an individual who could develop better comprehensive plans and who could better visualize the impacts of decisions," he said.

Kim Robson, an executive in NGA's Acquisition Directorate serving on a matrixed rotation to the InnoVision Directorate, considers her assignment a commitment to continued growth

Intelligence Community Assignment Program (ICAP)

- *Open to Bands 4, 5 and Executives.*
- *Participating organizations include CIA, NSA, DIA, FBI, the intelligence elements of the Army, Navy, Air Force, Marines, Department of Treasury and other Intelligence Community members.*
- *Assignments last up to two years.*
- *NGA typically sends out one or two ICAP employees per quarter.*
- *Watch for the quarterly announcements.*

and development towards helping to build and deploy NGA's Geospatial Intelligence Knowledge Base.

Linking her learning experience to the advancement of GEOINT, Robson stated, "We have all better served our customers and our nation by providing better, more responsive systems for our analysts and warfighters. This has only been possible by understanding the broader scope of the problems we are trying to solve as an Agency. The cross-NGA rotations and the cross-community rotations guarantee that we are doing the best for the nation and breaking down the territorial stovepipes."

Terence Meehan, Provost of the National Geospatial-Intelligence College, recently returned from the Defense Intelligence Agency, where he served in a GEOINT support role through the Intelligence Community Assignment Program (ICAP). He worked with the military service intelligence schools and combatant command intelligence trainers to improve entry-level training for all-source analysts. Meehan said he brought back a deeper understanding of the tradecraft and a network of contacts within the Community.

Rotations are one of eight program elements in Phoenix—NGA's Leadership Development Initiative for all levels of the work force. Through Phoenix, the National System for Geospatial-Intelligence (NSG) will prepare a leadership team for the future of geospatial intelligence (GEOINT).

"The College saw the value of my going out on rotation to me and to the College," he added. "We stayed in contact while I was at DIA, so I was ready to be placed in a challenging new position when I returned."

Clapper believes that NGA's talented women and men are the Agency's greatest resource. "Thanks to our people, this Agency continues to build on a reputation for excellence. I have never in more than 40 years in the intelligence business seen more 'attaboys' and 'attagirls' from outside customers," he said.

About the Author

Mary Dierker is Director of the School of Leadership and Professional Development, NGA's center for leadership, professional development, education, and intelligence studies.

Taking a Good Look— With UAVs, GEOINT Gains Power

Continued from page 11

Special Operations currently relies on traditional top-down, two-dimensional views of imagery or maps because access to the detailed information that analysts need to construct urban environments in 3-D is not available. Such data sets also take a long time to build and display.

The Urban Recon program will leverage improvements in laser technology and visualization software from earlier ACTDs. The UAV sensor will include a gimbaled mount and ultimately a variable zoom function supporting collection at up to 8 kilometers in range.

NGA's role in this program is to ensure that data is in standardized formats. Operational exercises to test the three sensors will occur in late 2004 through 2006. The plan calls for transition to U.S. Special Operations Command in 2006.

UAVs Critical to Success

With NGA's expertise in GEOINT, this Agency will continue to play an influential role in determining how sensors or data generators are provided in the "front end" of UAV architecture, so that the needed information is available for use at the "back end." UAVs are already critical to NGA's success in generating GEOINT as well as the success of customers in planning and executing precision operations. They will play an even greater role in the future.

Where are You in NGA's Big Picture?

By Ernie Moore

Can you tie what you do to the "Big Picture"? All of us should be able to visualize how we help NGA Know the Earth … Show the Way, through our individual roles, responsibilities and performance.

If we can make that connection, we're better able to support NGA's core values and transformation, as well as optimum organization performance. Just as importantly, making the connection will help us remain passionate about what we do.

My guess is that making the connection is more easily said than done. The model may help:

The box represents the organizational entity, NGA. Within NGA, the work force drives organizational performance from the three points shown in the triangle. At the top is senior leadership (the Executive Committee and Key Components). At the sides are managers and supervisors, and the overwhelming majority of the work force (government civilians, military and contractor employees).

To function optimally, NGA needs each point of the triangle focused on our mission—to provide timely, relevant and accurate geospatial intelligence (GEOINT) in support of national security—represented by the white arrows inside the triangle.

Focusing on the mission requires leadership: in NGA, leadership is everyone's business. This concept is essential to NGA's transformation, represented in the model by the leadership loop. NGA's leadership development program—Phoenix—promotes this concept.

Communication is the lifeblood of effective leadership. The ability to listen, read, write, speak and communicate non-verbally—within

our directorates, cross-functionally and externally—is critical in sharing the NGA vision and successfully accomplishing our mission. Communication is represented in the model by the red and yellow arrows.

From every point of the triangle, NGA must reach out to our customers and stakeholders, Intelligence Community partners, industry and academia to achieve the Agency's vision. This use of "outsight" is essential if we are to rapidly respond to the need for change, innovate and remain on the cutting edge. We need to stay abreast of customer needs, technological trends, world geo-political developments, and advances in our respective professions.

Everyone should be able to relate to this model and know where he or she fits in the big picture. For example, imagery analysts play a leadership role when they alert the Intelligence Community about new information vital to the nation's security. At the same time, their need to communicate well is more important than ever, as collaboration among the intelligence disciplines continues to grow.

In another example, security guards are leaders when a breach of security demands action. At the same time, skillful communication—with the perpetrator, fellow guards or security staff—can prevent a dangerous situation from getting out hand.

Each one of us must take leadership when called upon and communicate well in our work relationships. In doing so, we influence the shape of the Agency for years to come. Can you make that connection to the big picture?

About the Author

Ernie Moore coordinates the Agency's Supervisory and Management Training Program for the School of Leadership and Professional Development.

A contractor with Command Technologies Inc. in St. Louis, he was the Inspector General of the National Imagery and Mapping Agency, now NGA, before his retirement in Bethesda, Md., as an Air Force colonel in 2001.

"Where Our National Security Begins..."

geoint 2004 symposium

October 12-14, New Orleans, LA
Sheraton New Orleans Hotel

Learn how geospatial intelligence is truly part of our nation's "foundation for security."

Five NGA Seniors will participate in the Symposium in New Orleans. This event continues the dialogue from last year's highly acclaimed GEO-INTEL 2003 SYMPOSIUM, where NGA leaders and industry executives gathered to discuss how geospatial intelligence supports our National Security.

Symposium Highlights:

Panel Discussions
- Geospatial Intelligence: Horizontal Integration from Tooth to Tail
- The GEOINT Community and Its Partners
- The Users Perspective on Integration
- Innovative Challenges for Successful Integration and Transformation

Keynote Speakers, including:
- Lt. Gen. James R. Clapper, Jr., USAF (Ret.), NGA
- Senator J. Robert Kerrey
- Lt. Gen. Michael V. Hayden, USAF, NSA
- Honorable George Tenet, Former Director of Central Intelligence

Technology Displays From Over 60 Different Companies

Networking Social Events
- Golf Tournament
- Geo-Caching Treasure Hunt
- "GeOrleans" Hospitality Night

Gala Awards and Hall of Fame Dinner
- Includes NGA's 2004 Innovations in Geospatial Intelligence Awards Program

The goal of the symposium is to bring together leaders of government, industry, and the military geospatial intelligence community in order to exchange information, understand current technologies, and encourage advancement of the geospatial intelligence tradecraft.

For more information go to www.usgif.org/symposium

Sponsored by The United States Geointelligence Foundation (USGIF)

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

WWW.NGA.MIL