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GLOBAL GEOINT ENTERPRISE



ON MY MIND

Collaboration at Home and Abroad: The GEOINT Advantage

Close working relationships with our national and international partners are fundamental to the National Geospatial-Intelligence Agency's success. As the leader in GEOINT, NGA understands that intelligence is strengthened by incorporating many perspectives and points of view. We have stepped forward to collaborate with partners from the Intelligence Community, the Department of Defense, industry, the international arena and academia. Our shared opportunity lies in working together on technology, policies, capabilities, doctrine, activities, people and communities to produce GEOINT in an integrated, multi-intelligence, multi-domain environment. GEOINT is bigger than any one agency.

The array of resources, training, experience and insight that our partners bring to the table benefits us all. Working with our national and international partners ensures a more diverse understanding of our intelligence challenges and leads to greater mission effectiveness. For example, Unified GEOINT Operations allow for coordinated analysis and production efforts between NGA and our partners. We have seen great progress in operating as a more integrated team to advance a common mission.

Collaboration also enables us to identify redundancies and improve our collective operations. We are being called upon to be more efficient and to eliminate duplication of effort. Secretary of Defense Robert Gates has asked all Defense Department agencies to find ways to redirect resources from overhead and support functions to critical mission areas so that we can continue to provide what the warfighter needs today and in the future. The Director of National Intelligence has the same perspective. In this context, collaboration, communication and information sharing drive real results.

In this issue of the Pathfinder, you will see how, at the national level, NGA partners with the Federal Bureau of Investigation's Geospatial Intelligence Unit to enhance the bureau's GEOINT capability through training and product development. We also highlight our collaboration at the international level with Thailand, a country that experiences flooding and other natural disasters on a regular basis. We are working with our Thai counterparts to train and develop their GEOINT analysts and capabilities to help them save lives and alleviate suffering. And we have a history of providing GEOINT support to our other international partners in times of crisis within their borders and of joining with them, as we did in Haiti and Chile after the earthquakes in those countries. More and more, these types of situations require that we work in open environments to share our information, data and products with many new partners.

By sharing data and information, and the use of interoperable technology, tradecraft and methodologies, our domestic and global partners help deliver the GEOINT advantage in response to security challenges, natural and man-made disasters and special security events. Together we are building a strong global community of GEOINT professionals.

LETITIA A. LONG
Director

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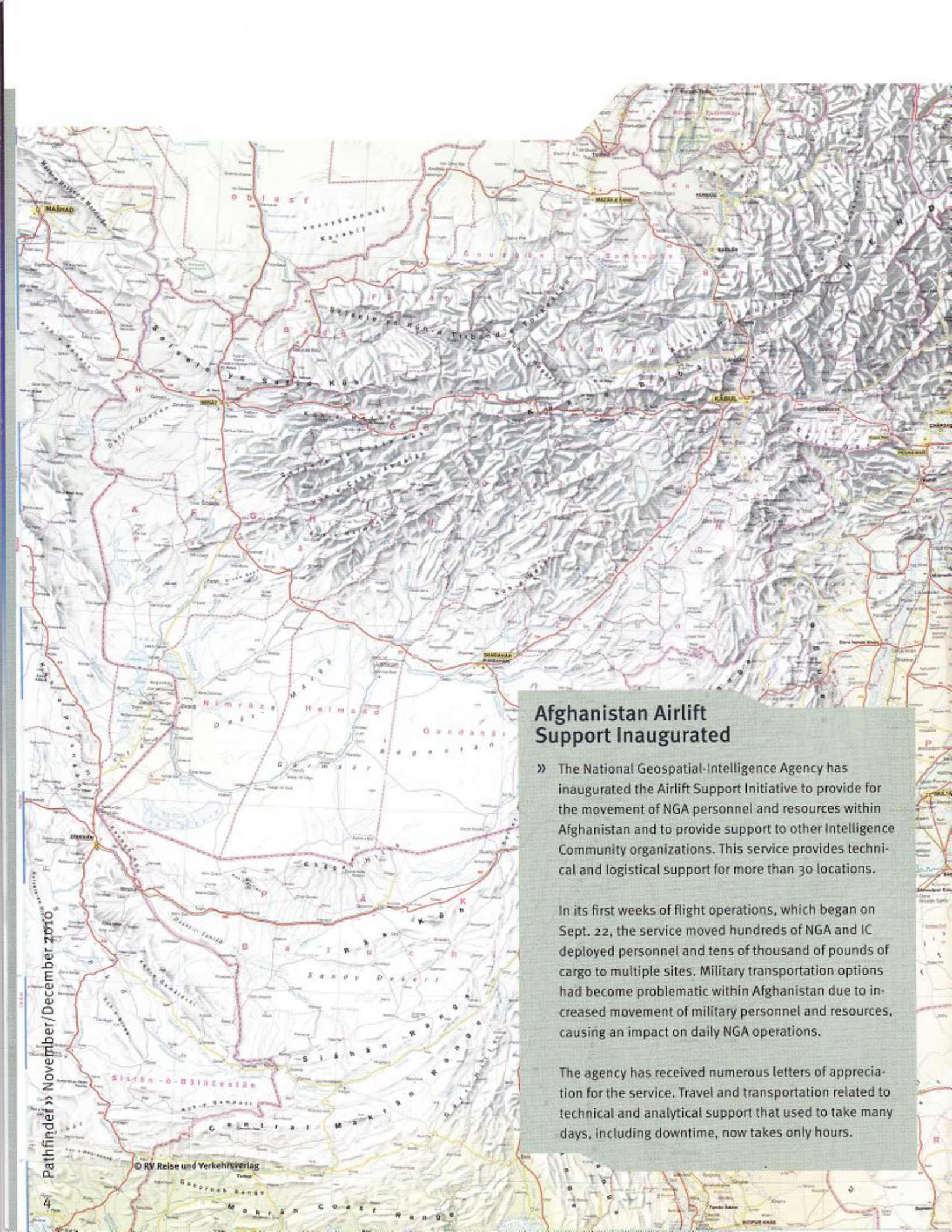
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Ronald Kee

ON THE COVER

The amount of geospatial intelligence produced and consumed in the United States and across the world rises every year. As the demand for GEOINT increases, so does the necessity that the federal, industrial, academic and international partners producing it come together to share data, resources and best practices. GEOINT has become a global enterprise, and the National Geospatial-Intelligence Agency actively pursues worldwide partnerships, collaboration, coproduction and unified GEOINT operations to meet its mission. *Cover design by Kipling Williams.*

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Afghanistan Airlift Support Inaugurated

» The National Geospatial-Intelligence Agency has inaugurated the Airlift Support Initiative to provide for the movement of NGA personnel and resources within Afghanistan and to provide support to other Intelligence Community organizations. This service provides technical and logistical support for more than 30 locations.

In its first weeks of flight operations, which began on Sept. 22, the service moved hundreds of NGA and IC deployed personnel and tens of thousand of pounds of cargo to multiple sites. Military transportation options had become problematic within Afghanistan due to increased movement of military personnel and resources, causing an impact on daily NGA operations.

The agency has received numerous letters of appreciation for the service. Travel and transportation related to technical and analytical support that used to take many days, including downtime, now takes only hours.



NGA photo

Lisa Spuria

Director Announces New Key Appointments

On Sept. 24, NGA Director Letitia A. Long announced that Lisa Spuria had been selected to serve as NGA's Chief Operating Officer. Spuria replaced Richard Fravel, who departed NGA for an assignment as the Assistant Director of National Intelligence for Policy, Plans and Requirements.

Spuria served most recently as the deputy director of NGA's Analysis and Production Directorate. She has more than 25 years of experience as an Intelligence Community officer, beginning her career as an imagery analyst with the Central Intelligence Agency in 1982.

On Sept. 30, the director also announced the establishment of the senior advisor for strategic outcomes and named Regina Genton to the position.

Genton most recently served as the Senior Advisor for Strategic Initiatives to the CIA Director for Science and Technology and as the Assistant Deputy Director for National Intelligence, or ADDNI, for Policy where she led Intelligence Community policy design and development on behalf of the Director of National Intelligence.



Photo Illustration Courtesy of Lockheed Martin

Artist conception of GeoEye-2 which is currently being built to support the EnhancedView program.

Agency Awards EnhancedView Commercial Imagery Contract

On Aug. 6, NGA competitively awarded contracts for the EnhancedView commercial imagery program.

DigitalGlobe Inc., of Longmont, Colo., received an award for \$3.5 billion and GeoEye Imagery Collection Systems of Dulles, Va., an award for \$3.8 billion. The period for performance of the contracts is 10 years if all options are exercised.

These contracts will provide products and services to help meet the increasing geospatial intelligence needs of the Intelligence Community and Department of Defense.

EnhancedView also provides more imagery, greater access, priority tasking and improved capability and capacity to government customers from the next series of U.S. commercial imagery satellites.

NGA Signs CRADA With Overwatch

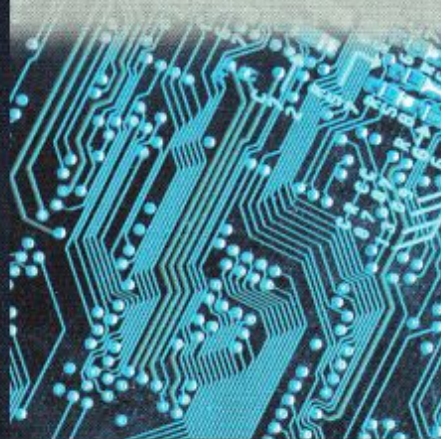
The National Geospatial-Intelligence Agency and Overwatch of Texas, an operating unit of Textron Systems, have signed a five-year Cooperative Research and Development Agreement to further develop and enhance current Overwatch geospatial software products, such as RemoteView Professional, Feature Analyst, LIDAR Analyst, Mensuration, RemoteView Video Tracking, RemoteView 3D Professional, GeoCatalog and RemoteView Connect.

The CRADA will also initiate development and integration of new products and capabilities to better exploit geospatial intelligence data.

Results of the CRADA will be shared with the National System for Geospatial Intelligence, and NGA has the option of demonstrating new products to selected working groups and technology forums.

"This is an exciting opportunity for Overwatch and NGA, with focused attention on increased workflow efficiency and creating new avenues for solving intelligence issues," said Stuart Blundell, Overwatch vice president of Geospatial Products and Solutions.

"This is a great example of industry and government working together to provide advanced tools for GEOINT professionals," he said.



GUEST COLUMN

Commercial Imagery Promotes International Cooperation

BY DAWN EILENBERGER

Rapid access to unclassified imagery to support disaster response allows the National Geospatial-Intelligence Agency to provide planners and coordinators with comprehensive situational awareness when they need it the most.

Commercial imagery plays a key role in these events because it allows governments to freely share data that might otherwise have been classified. This year alone, NGA has responded to several disasters, including the Haiti earthquake and the Deepwater Horizon oil spill in the Gulf of Mexico.

The NextView contract gives NGA constellation-like access to DigitalGlobe's and GeoEye's five high-resolution electro-optical commercial satellites. Combined with NGA's access to French Spot Image electro-optical satellite imagery and data from Italy, Germany and Canada's radar satellites, NGA now has access to almost a dozen commercial imagery satellites.

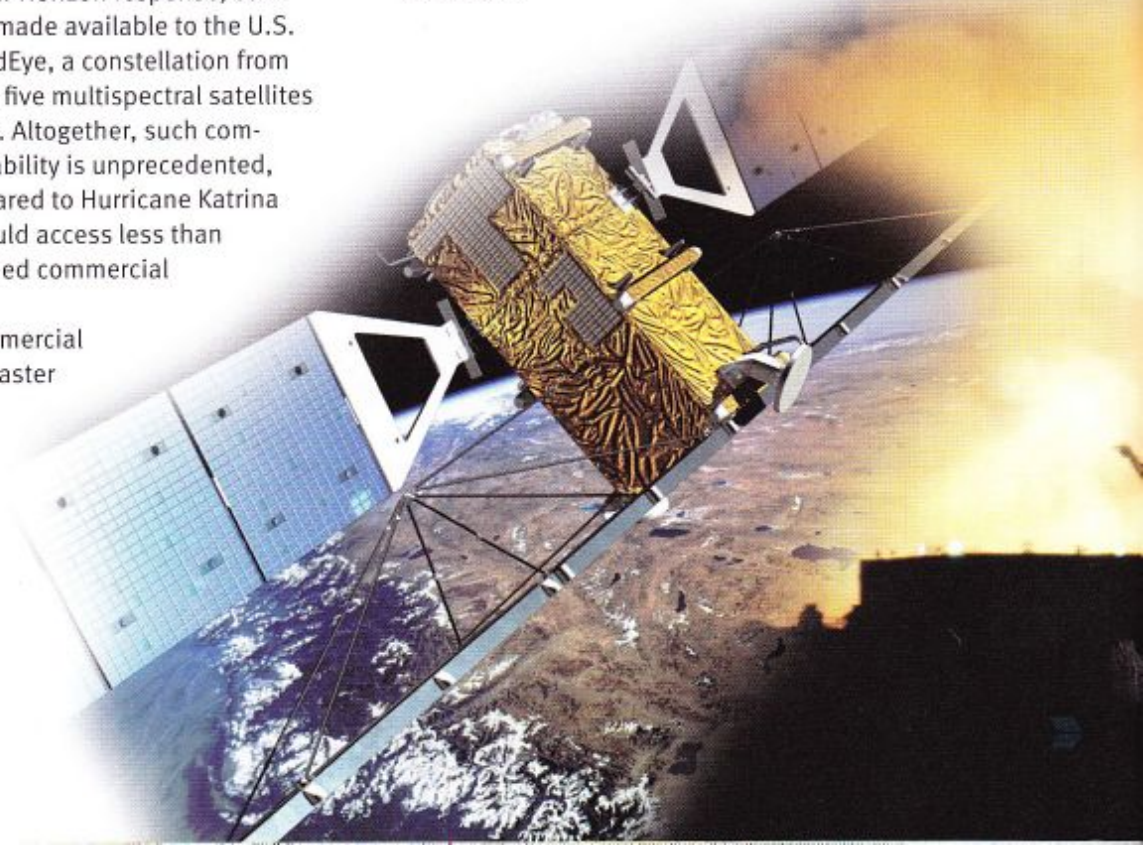
During the Deepwater Horizon response, commercial data was also made available to the U.S. government from RapidEye, a constellation from Germany that includes five multispectral satellites with a daily revisit rate. Altogether, such commercial imagery availability is unprecedented, especially when compared to Hurricane Katrina in 2005, when NGA could access less than half as many unclassified commercial imagery systems.

The demand for commercial imagery to support disaster response and other critical mission areas will continue to grow. Today, commercial satellites are producing massive archives of data that have yet to

be fully exploited for mapping and monitoring environmental change. This access provides incredible potential for commercially available archive imagery to support, for example, AFRICOM's capacity building efforts for an area approximately the same geographic size as the United States, China, India and all of Europe combined.

GeoEye and DigitalGlobe have around 1.5 billion square kilometers of the highest-resolution commercial imagery available in their archives, and Spot Image recently announced more than 100 billion square kilometers of imagery holdings between 2.5 meters and 10 meters spanning all the way back to the 1986 launch of SPOT-1.

The future development of commercial imagery sources also looks promising. NGA recently awarded contracts for EnhancedView to DigitalGlobe and GeoEye with a period of performance for 10 years if all of the contract options are exercised.



Since this award, both U.S. companies have announced plans to build next-generation, high-resolution commercial satellites.

In Europe, France is about to launch the first of two Pleiades high-resolution electro-optical satellites, and SPOT 6 and 7 are also in development. Germany is flying two identical synthetic radar aperture satellites a few hundred meters apart in space and will eventually produce the only global digital elevation model ever developed from a single commercial sensor, while also planning its next-generation SAR system.

South Korea is expected to launch its Komsat-5 SAR satellite by the end of the year, followed shortly by the launch of its Komsat-3 electro-optical system. Komsat-3 will launch on a Japanese rocket, further demonstrating a new level of cooperation with commercial systems that would

have been unheard of a few years ago. Japan is also planning to launch in 2012-2013 a small satellite capable of collecting 0.5-meter unclassified imagery—an endeavor supported by Japan's new space policy that specifically promotes space commercialization.

India currently has systems on orbit and in development with resolutions ranging from 1 kilometer to less than a meter that are supported by more than a dozen ground stations around the world.

Canada and Italy are both discussing follow-on SAR constellations, and countries like Spain and Turkey are becoming full members of the remote sensing community as they develop their own SAR and electro-optical systems.

The new U.S. National Space Policy released in June 2010 encourages the United States to enhance international cooperation and collaboration in space. Using and sharing commercial imagery in response to common international concerns provide one of the most effective ways to implement this objective.

Now more than ever before, NGA is able to “know the Earth” and monitor rapid changes on its surface during a crisis as well as changes occurring over time. Taking advantage of new sources of data will support NGA's geospatial intelligence mission with foundation data for change detection, geospatial readiness and production and help develop new geospatial tradecraft. P

*Dawn Eilenberger
is the Director of
NGA's Office of
International Affairs
and Policy.*

Photo Illustration and Images
Courtesy of Radarsat

UGO Principles Underlie NSG Functional Management

BY CHUCK K.

Functional management engages and capitalizes upon the broad geospatial intelligence community and the value that it can deliver, looking beyond NSA to the entire GEOINT analysis and production partnership—the National System for Geospatial Intelligence.

Managing such a large enterprise requires an understanding of its scope, capacity and capabilities. To fully leverage that capability—which exceeds the sum of any partners' individual efforts—the NSG must apply the principles of Unified GEOINT Operations, or UGO.

UGO is the “standardized and repeatable process to assess, align and execute GEOINT operations across the NSG.”

Three principles guide the implementation of UGO. The first is insight and access. By inventorying NSG resources, the community can obtain a detailed look at the capacities, capabilities and focus of NSG members and partners. Each year, designated UGO officers and managers, in support of organizations across the GEOINT enterprise, develop strategic business plans, looking a year ahead at anticipated resources, missions and areas of focus.

While it is relatively easy to coordinate activities with someone in the next cubicle or down the corridor, it is considerably more difficult to grasp the entirety of GEOINT activities transpiring across the

NSG. UGO planning conferences and the resulting production plans are the first steps toward identifying and assessing GEOINT work being done across the community.

The second principle of UGO is alignment. Through a series of conferences, UGO officers and managers and the regional and functional NSG operations executives, or NOXs—community-wide GEOINT leaders—make it possible for NSG members and partners to assess how their capabilities and efforts align and mesh with those of others across the community. Through these conferences and subsequent meetings, NSG members minimize unnecessary duplication of effort and work towards reallocating freed analytical resources to fill shortfalls and gaps. Ultimately, the NOXs roll up those plans into their functional or regional GEOINT plans.

The third principle of UGO is centralized management and decentralized execution. The collection and roll-up of individual plans are a centralized management function conducted at the NOX level in coordination with each participating GEOINT organization.

Execution (including decisions on how to expend resources) is decentralized, fully empowering each GEOINT organization's UGO officer and UGO manager to determine how best to fulfill their mission responsibilities with a broader understanding of



what others in the NSG enterprise can do.

The UGO Directory, a web-enabled, interactive database of NSG operations, is the tool behind the process. From it, the entire NSG has visibility into what the many GEOINT-producing organizations are doing. With that information, everyone—especially the NOXs—is in a much better position to communicate the work they are doing, the problems they face and the solutions they have discovered.

UGO played a pivotal role in the NSG's recent Haiti earthquake response. NGA's Haiti Crisis Action Team leader, working as the regional NOX for the Americas, was able to call upon the full array of NSG's GEOINT producers.

Employing the principles, capabilities and power of UGO allowed decision makers, such as the Naval Oceanographic Office and the U.S. Transportation Command, to assess the needs of the crisis responders, align the efforts of dozens of organizations and get critical GEOINT into the hands of emergency response teams.

Finally, consider this future scenario; a disaster impacts an NSG organization, rendering it out of commission for a period of time. Armed with a detailed knowledge of the NSG enterprise, functional managers are able to accurately assess the loss of capabilities, know where similar capabilities reside and quickly redirect assets to fill critical mission

gaps. That is the power of UGO, and it is happening today.

We operate in a budget-constrained environment of ever-increasing, worldwide challenges. The NSG must make the best use of every enterprise resource, being as responsive as possible to the needs of its members and mission partners. Fully realized, Unified GEOINT Operations is the collaborative, synergistic effort that gives everyone in the NSG the ability to properly assess and align resources to execute the mission for the best possible outcome for all. Understanding the breadth of the enterprise, aligning effort and executing effectively—these constitute the central concept of functional management in the NSG. P

Chuck K. is a contract employee with the Functional Management Executive for Operations.

Editor's note: See the article on page 16 of this edition for more on Canada's contribution to the UGO efforts responding to the earthquake in Haiti.

Crowds gather for the 56th presidential inauguration in Washington, D.C., on Jan. 20, 2009. NSG affiliated organizations including NGA, the U.S. Secret Service, the FBI, the Federal Emergency Management Agency and the Department of Defense came together to support the event. Moving beyond co-production, the organizations effected precise and real-time geospatial intelligence based on a shared, collaborative understanding of the mission and the capabilities across the enterprise. Satellite image courtesy of GeoEye ©2009.



NSG Extends GEOINT Reach to Unclassified Communities

BY CHRISTINA H.

The National System for Geospatial Intelligence is working to bring unclassified geospatial intelligence products and information to a widening field of users and consumers through an alternative dissemination structure addressing the needs of the NSG's unclassified partners.

Emergency responders, federal, state and local authorities, foreign partners and nongovernmental organizations supporting disaster relief or other critical situations routinely rely on releasable maps, graphics, models and other geospatial products.

In providing quick responses to crises and natural disasters around the world, international and domestic GEOINT communities have developed a collection of GEOINT products. Their commendable work has alleviated suffering and facilitated recovery, but also resulted in an uneven set of policies and dissemination tools that can impede information sharing.

The NSG has taken on the challenge of creating order from well-intentioned disorder. The NSG's chief functional management officer has requested a formal analysis of information-sharing needs and capabilities within the geospatial community and their effects on the intelligence cycle of tasking, collection, production, exploitation and dissemination, or TCPED.

This complex analysis must weigh each aspect of the TCPED process to identify the requirements, opportunities and gaps encountered by moving GEOINT throughout the unclassified world.

A World of New Partners

The value of GEOINT is undeniable, and the demand for GEOINT support is increasing. Repeated after-action reports from crises like the Haiti earthquake response and the Deepwater Horizon oil spill in the Gulf of Mexico articulate the need to share GEOINT across partnerships.

The NSG has been extremely successful sharing with its defense, intelligence and foreign partners through Service GEOINT Elements, National Geospatial-Intelligence Agency Support Teams, and other interagency and international collaborative relationships.

In 2010 alone, GEOINT operations supported relief efforts for the earthquakes in Haiti and Chile and the Deepwater Horizon oil spill.

These operations illustrate the demand for hardware, applications, storage and bandwidth to satisfy operational needs when users require quick access to geospatial products on unclassified networks.

In supporting the Deepwater Horizon oil spill remediation efforts, NGA provided analysis, commercial satellite imagery and geospatial products of the Mississippi River Delta and surrounding Gulf Coast areas. The products included 3-D models of major infrastructure along the



Gulf Coast, operational planning map atlases and graphics depicting the extent of the oil spill. These products greatly assisted the U.S. Coast Guard, the lead federal agency for the disaster, in its response efforts.

The NSG's networked structure requires it to think about its partners' partners. If the Coast Guard or the U.S. Department of State wants to share a product with a local partner or nongovernmental organization providing critical services, then the NGA and the NSG need to adjust for this relationship even before the product is created.

Members of the NSG, including NGA, are already addressing these challenges. During crisis operations, NGA, relevant combatant commands and the State Department use workarounds to produce and disseminate geospatial products by transferring information between multiple systems.

Nevertheless, without an end-to-end TCPED process and the associated standards, policies and equipment in place, these nonuniform methods often result in information that agencies cannot reuse or that they can provide to only a fraction of those needing it.

Preventing Crises by Building Capacity

Building geospatial capacity is just as important as supporting crises, and the agency's engagement with Africa exemplifies that philosophy. NGA is gaining recognition within the African geospatial analysis community through efforts of the NGA Support Team for the U.S. Africa Command. The NST, working as part of AFRICOM's interagency team, provides timely, value-added GEOINT to support the command's security engagements, military-to-military programs and civil operations as it promotes a stable and secure African environment.

The NSG interacts with the African professional geospatial community through events like the AfricaGIS Conference, held in Kampala, Uganda, in October 2009. This biennial conference and

other AFRICOM-led efforts give NGA analysts an enhanced perspective on global geospatial information challenges while providing an opportunity to explore new developments, products, datasets and trends.

Capacity building also develops relationships. Following the 2009 AfricaGIS Conference, analysts provided direct support to the U.S. defense attaché in Kampala and created customized products to support U.S. engagements with the Ugandan People's Defense Force leadership.

Just as capacity building in Eastern Europe in the 1990s resulted in the 28-member Multinational Geospatial Coproduction Program, current engagement with Africa provides immense opportunities for the future. Building capacity and sharing information within the African geospatial community, or any community in the world, requires information and products that are affordable and easily available to partners.

Crisis response and support to federal and international partners demonstrate a diversity of mission areas with unique information-sharing needs, yet all these missions' differing needs are more easily fulfilled and far more productive through standardized and consistent dissemination. The ability to meet the world's demands requires an efficient way to access, exploit and disseminate geospatial products with partners whose information technology systems vary and are not compatible with those of the NSG, NGA and the U.S. Department of Defense.

Moving toward unified unclassified engagement is the next step in GEOINT maturation. **P**

Christina H. is a staff officer in the Office of Geospatial Intelligence Management.



Thai Cooperation Enhances Disaster Relief

By MELISSA M.

The National Geospatial-Intelligence Agency provides geospatial intelligence support to humanitarian and disaster-related events around the world. Because of the numerous large-scale natural disasters in Asia-Pacific area, NGA and its Asia-Pacific partners are collaborating to standardize and improve GEOINT support to humanitarian assistance and disaster relief in the region.

Thailand, a country that encounters flooding and other natural disasters on a regular basis, is one of the nations that partners with NGA on the response to these crises. In November 2009, NGA and Thailand's Geo-Informatics and Space Technology Development Agency, or GISTDA, signed a Memorandum of Understanding to support GEOINT

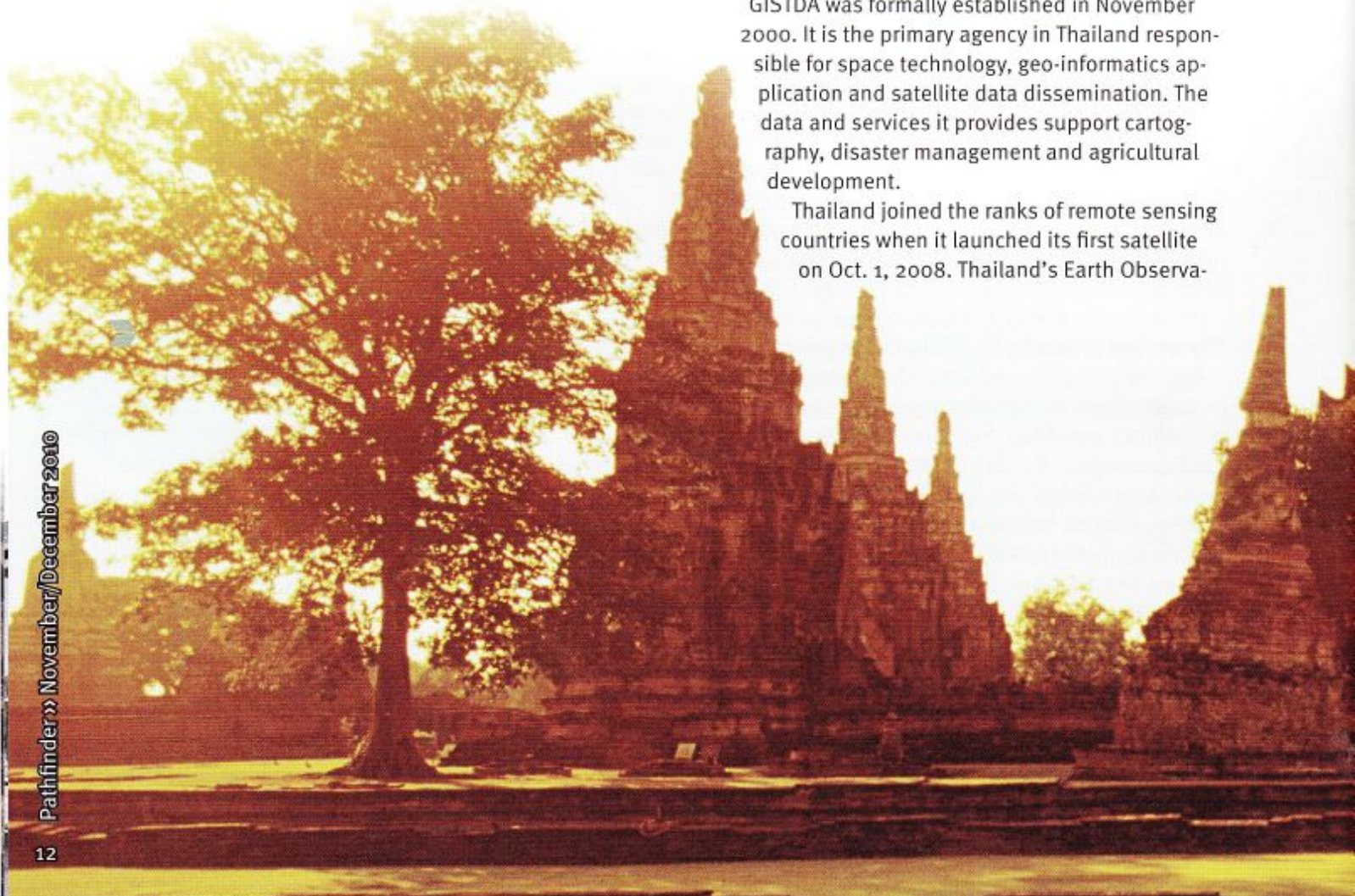
collaboration on humanitarian and disaster-related issues. The event marked a major milestone in NGA's relationship with Thailand.


Since the signing of the MOU, the two agencies have participated in technical exchanges and shared geospatial information to support the development of a handbook, case study and analytic methodologies for humanitarian assistance and disaster relief. The overall goals of the interagency work are to share analytic expertise, promote interoperability and leverage resources to enable timely support to mitigate crises and disasters throughout the region.

Expanding Thailand's Capabilities

GISTDA was formally established in November 2000. It is the primary agency in Thailand responsible for space technology, geo-informatics application and satellite data dissemination. The data and services it provides support cartography, disaster management and agricultural development.

Thailand joined the ranks of remote sensing countries when it launched its first satellite on Oct. 1, 2008. Thailand's Earth Observa-





tion Satellite, or THEOS, has a medium-resolution imaging capability that covers the Asia-Pacific region.

Enhancing Humanitarian Assistance

NGA analysts supporting U.S. Pacific Command have developed a humanitarian assistance and disaster relief handbook in an effort to establish GEOINT standards and document methods and procedures for developing geospatial products in a repeatable and uniform way. Various international partners have contributed to the handbook, which will be used at an annual training class held in Hawaii. GISTDA is one of several international organizations that have sent participants to the training class, which also serves as a forum for sharing what has worked best in the Asia-Pacific region.

NGA and GISTDA share geospatial data, including THEOS imagery, which can be used for joint projects and NGA analysis. In August 2010, NGA provided technical training in Bangkok related to cartography and geospatial analysis for humanitarian and disaster-related events. GISTDA, in addition to the Royal Thai Survey Department of the Royal Thai Armed Forces,

provided meaningful feedback to NGA regarding international and cross-cultural considerations for GEOINT products used in these situations.

Emulating Interagency Collaboration

Following a natural disaster, strong international partnerships are critical for providing quick responses to save lives and prevent further infrastructure damage. NGA's relationship with GISTDA represents a model to follow for quick collaboration. Both agencies regularly exchange expertise and geospatial information to improve their capacity to provide quality GEOINT products.

NGA's partnership with GISTDA signifies one of the initial nodes in the humanitarian assistance and disaster relief network of GEOINT expertise. P

Melissa M. is NGA's Office of International Affairs and Policy representative to U.S. Pacific Command.

Thinkstock Photo

Improving Geospatial Data for Humanitarian Support

SUBMITTED BY THE AUSTRALIAN DEFENCE IMAGERY AND GEOSPATIAL ORGANISATION



An initiative creating an online geospatial

data repository, led by Australia and Singapore on behalf of the Association of South-East Asian Nations, is enabling more consolidated, cohesive and successful humanitarian assistance and disaster relief, or HADR, operations worldwide.

A senior Australian Defence Imagery and Geospatial Organisation executive, Frank Colley, is driving the capability initiative, which aims to draw members of the ASEAN Regional Forum and neighbors together.

"DIGO has been involved in supporting HADR for many years," Colley said. "However, experience has taught us that the provision of timely and effective support in times of crisis is greatly affected by the ready availability of source data."

HADR events are erratic and unpredictable when they strike, and the ARF is highly supportive of a system that can support short-notice, urgent operations.

Australia, Southeast Asia and the Pacific region are environments that are extremely susceptible to natural disaster and justify the requirement for humanitarian assistance.

The region also contains some extremely remote and uncharted areas, where available information,

data and mapping are poor or even nonexistent. The 27 member states of the ASEAN Regional Forum aim to foster dialogue, consultation and diplomacy on political and security issues of common concern and interest throughout the Asia-Pacific region.

According to Colley, successful HADR operations are principally enabled by a series of well-made and timely decisions, and many of these decisions have a critical, underlying spatial or geospatial component, such as:

- »What type of disaster has occurred, and what is the extent?
- »Who and what have been affected?
- »Where is the response most required?
- »How will the response transit, and where will it arrive?
- »How will distribution occur?

Glenn Maiden leads DIGO's efforts in responding to HADR crises.

"The tsunami of 2004 wreaked shocking damage in the South-East Asian region," Maiden said. "The ramifications of this event were pivotal to ASEAN member countries when reassessing how to better plan for and respond to future disasters. In particular, the ARF recognized that the availability

of geospatial data in a timely manner is a critical enabler for a successful HADR effort."

At the ARF intersessional support group meeting in April 2009, Australia proposed the concept of an online, geospatial warehouse: the ARF Disaster Relief Mapping Service, or ARF DReaMS, provides a central location for countries affected by disaster to share geospatial information.

"We are particularly pleased that Singapore formally agreed to cosponsor the ARF DReaMS initiative, which was a major factor in achieving endorsement by the ARF Ministers on 23 July 2009," Maiden said.

The aim of ARF DReaMS is to provide a central data repository that is populated with broad-scale base data, with a key focus on aeronautical data for South-East Asia and the Pacific.

ARF DReaMS is based on Web service technology, where traditional maps, data and any relevant geospatial information are made available digitally. As a baseline, the system is nominally a 1:500,000-scale map skin, augmented with commercially sourced aeronautical data.

In the initial capability, ARF DReaMS operates much like any traditional web portal, where members authenticate to a secure site to access and upload geospatial data relevant to HADR planning and operations.

Once a representative from a member country logs on to ARF DReaMS, the user is able to upload any additional information related to the member country's area of responsibility and access the data provided by all members when supporting HADR missions.

Member countries are expected to provide more detailed data on a voluntary basis and are not expected to upload any sensitive data. "DIGO envisages an open system that is able to accept any available data relevant to the HADR mission at hand, such as geospatial data, photos, PDF documents, etc.," Maiden said.

Colley said that DIGO views the system as evolutionary. "We believe that the ARF DReaMS capability provides a great foundation for future development," Colley said. "Once our ARF partners build their confidence in the site and see its potential, the site will rapidly expand in the level of participation and the range and utility of the data made available.

"The July rollout is focused on delivering an initial HADR data warehouse and dissemination capability... so once the system has proven its utility and viability in the HADR arena, it is expected that ARF DReaMS will be augmented with additional capabilities, such as advanced geospatial modeling and editing tools.

"By proactively making HADR information available before a crisis, we aim to facilitate enhanced HADR planning and training and assist in the development of policies for better information sharing," Colley said.

In times of crisis, the system will provide prompt and consistent data dissemination and will link the people who are providing support to enable more effective and timely HADR outcomes—a great win-win situation for the region.

Since going live in July 2010, discussions with regional countries and their respective geospatial agencies have been positive in support of the need for a geoportal like ARF DReaMS. Communication through the ASEAN Regional Forum Inter-Sessional Meeting on Disaster Relief in September 2010, has also been promising.

ARF DReaMS will be used in support of the upcoming ASEAN Regional Forum Disaster Relief Exercise, to be held in Manado, Indonesia, in March 2011. This will test its capability in a live environment by all support agencies, indigenous and international. P

Editor's note: This article was adapted from a story that originally appeared in Defence, the official magazine of the Australian Government Department of Defence, Issue 5, 2010.



Canada Responds to Haiti Earthquake

BY MAJ. ED BATCHELOR, CANADIAN ARMY

The major earthquake that struck Haiti on Jan.

12, 2010, triggered a number of responses amongst the National System for Geospatial Intelligence and its partners.

Canada contributed significantly to the effort with its National Geospatial Intelligence Support Team, part of Canada's Directorate Geospatial Intelligence, or D Geo Int, generating 43 geospatial intelligence products in the first week of the crisis. Primarily situational awareness products, damage assessments and route studies, half of them were produced within 48 hours of the 7.2 magnitude earthquake, greatly informing the decision making of senior military leadership.

Following the disaster, National Geospatial-Intelligence Agency realized that more current and accurate foundation data of Haiti was needed. In response, the agency requested D Geo Int's help to mitigate the shortfall.

Canada is a lead nation in the Multinational Geospatial Coproduction Program, a 28-nation consortium producing high-resolution vector data on areas where quality foundation data is lacking. Canada had signed up to produce MGCP foundation data for Haiti and had completed 90 percent of the MGCP data cells over Haiti when the earthquake struck. A data cell is a one degree by one degree area of the Earth's surface and contains 16 1:50,000 meter Topographic Line Maps, or TLMs.

In response to NGA's request, the Canadian Forces Mapping and Charting Establishment, a D Geo Int line unit, quickly reallocated resources towards the completion of the Haiti data cells. Within 10 days of the disaster, the Canadians were completing two cells per day.

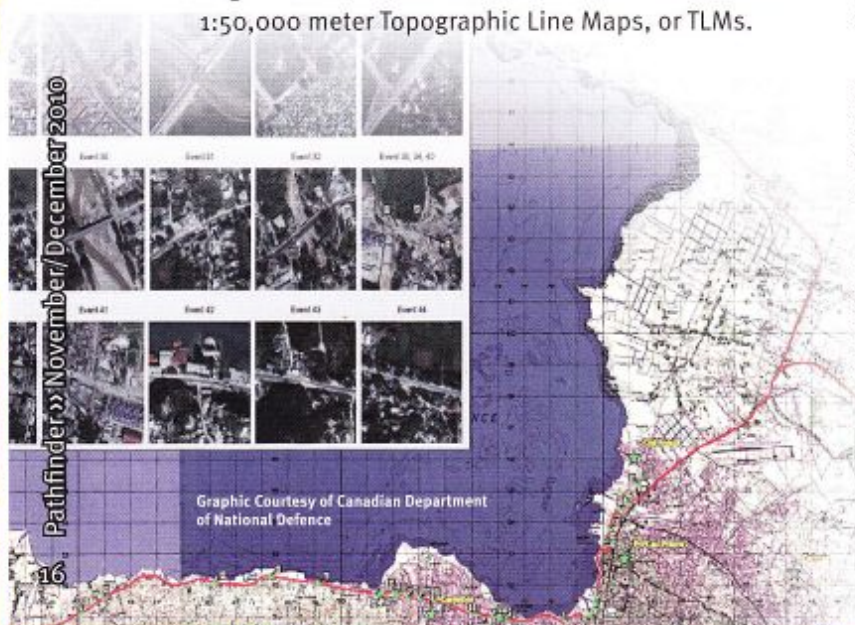
The MGCP exemplifies the utility of coproduced foundation data and its application toward generating graphics to support relief efforts. MGCP-derived graphics, or MDGs, are similar to TLMs, but can be produced and delivered more rapidly to warfighters or first responders. Each TLM can take months or even a year to produce. MDGs may not meet 100 percent of military specifications, but they do give the "boots on the ground" a map to meet their mission requirements.

Canada used the MGCP foundation data to produce a series of six 1:50,000 scale TLMs and nine 1:50,000 MDGs. The Canadians printed 6,000 copies of each product, with 3,000 copies going to NGA, 50 to the U.S. Southern Command via NGA, and 1,500 forwarded to various other forces deployed to Haiti in response to the earthquake. Additionally, the MGCP foundation data was used as the basis for numerous other geospatial intelligence products generated throughout the NSG. These products were essential to those planning and executing response, recovery and relief operations in Haiti.

Canada is a member of the Allied System for Geospatial-Intelligence, an NSG partner that represents the strong GEOINT relationship between Australia, Canada, New Zealand, the United Kingdom and the United States.

Owing to its preparedness and versatility, Canada proved a major GEOINT contributor to the positive overall NSG relief efforts in Haiti. Additionally, Canada's efforts reinforce the value of the MGCP and Unified GEOINT Operations. P

Maj. Ed Batchelor is the senior Canadian geospatial intelligence liaison officer assigned to NGA.



Another Pathfinder Propels U.K.'s GEOINT Fusion Centre

BY TIM FRYER

The United Kingdom Ministry of Defence is building a new geospatial intelligence complex at the Royal Air Force base in Wyton, Cambridgeshire. By summer 2013, the main structure, fittingly named the Pathfinder Building, will house major elements of the ministry's recently created Intelligence Collection Group, including the group's headquarters and its Joint Air Reconnaissance Intelligence Centre—National Imagery Exploitation Centre.

It will also become home to the planned Defence Geospatial Intelligence Fusion Centre, or DGIFC (pronounced “dee-giff-see”), which will focus on multi-intelligence fusion.

The prospect of collocating much of the ICG staff at RAF Wyton made the plan for the DGIFC possible. With assistance from U.S. intelligence agencies, including the Defense Intelligence Agency and the National Geospatial-Intelligence Agency, the MOD Defence Intelligence organization successfully explored the concept of this multi-intelligence collaborative environment.

Although the majority of Defence Intelligence personnel at Wyton will be GEOINT specialists, signals, human and measurement and signature intelligence personnel, many of whom are part of ICG based elsewhere in the United Kingdom, will contribute to the DGIFC output. It is anticipated that more than 30

Americans—many from NGA—will work alongside their British, Canadian, Australian and New Zealand allies and colleagues.

A smaller preliminary multi-intelligence unit will begin development at the JARIC-National Imagery Exploitation Centre this year—especially in support of the International Security Assistance Force in Afghanistan—as a 60-person DGIFC trial and demonstration.

Although akin to the NGA Campus East nearing completion in Springfield, Va., the uniquely shaped main structure of the U.K. complex is largely dictated by the 50,000-square foot open exploitation area where the analysis and fusion will take place.

The Pathfinder name commemorates the RAF Pathfinder Force, which provided precision target marking for RAF Bomber Command during World War II flying out of RAF Wyton and nearby airfields. The name remains pertinent to the role of the ICG components to be based at the new facility—to provide the intelligence and information required by U.K. and allied warfighters.

Tim Fryer is an employee at the United Kingdom's Intelligence Collection Group Headquarters.

UK MOD Photo

RAF Wyton's Intelligence Pedigree

For RAF Wyton the new construction and the move-in of the Intelligence Collection Group will mark its return to being a major intelligence-related base.

From 1953 until 1995, the RAF's main strategic photographic reconnaissance base was Wyton. For most of this time a Royal Engineer Air Survey Liaison Section supported the reconnaissance operations—thus the base would have qualified as doing GEOINT long before the term was created. In recent years, details of the base's

involvement in early overflights of Russia have emerged. Most of the RAF's Cold War electromagnetic intelligence and electronic warfare flights also took place at Wyton.

Wyton was also the home of the Joint School of Photographic Interpretation from 1969 to 1997, training imagery analysts from the UK and many overseas countries. For most of the time, a USAF exchange officer was on the staff—a further example of UK-U.S. imagery intelligence collaboration going back many years.

PARTNERSHIPS

Mentors Nurture Afghan Mapping Agency

By CRAIG M., ERIC W. AND BENJAMIN F.

1. GEODESY
2. GEOGRAPHY
3. CARTOGRAPHY

The national infrastructure of any country requires an accurate geospatial reference system. The National Geospatial-Intelligence Agency sends mentors to Afghanistan to help the Afghan government develop the three disciplines critical to such a system: geodesy, geography and cartography.

NGA chose the Afghan Geodesy and Cartography Head Office, or AGCHO, as a strategic partner, sharing a similar mission, to build the Afghans' capacity and create geospatial products with a coproduction capability.

NGA has been engaged forming agreements, providing leadership training and building the Afghan Mapping Initiative since 2006.

Geodesy Mentor

An NGA geodesy mentor embedded directly with the AGCHO Geodesy Department has provided technical expertise to the Afghan geodesists, overseen the installation of the Continuously Operating Referencing Station, or CORS, sites and provided training and other support.

Afghanistan's current geodetic surveying capability lacks modern equipment and resources. Therefore, a reliable network of permanent survey marks with established 3-D coordinates referenced to a defined coordinate system are necessary to create a foundation for all geospatial work.

A geodetic surveying capability that provides precise point positioning, accurate mapping and elevation determination is essential to the foundation for geographic information system databases, cartography, geographic names, navigation systems, cadastral work, resource man-

agement programs and anything requiring a 3-D geographic position.

NGA's Geodetic Surveys Division has undertaken to create a permanent reference network of GPS continually operating reference station sites throughout Afghanistan.

The CORS network contains more than 1,450 independently owned and operated stations managed by the National Oceanic and Atmospheric Administration's National Geodetic Survey.

The Afghan CORS network consists of 11 sites distributed geographically throughout the country. AGCHO has offices in 16 different cities, and most of the locations coincide with the placement of the CORS sites. A central server is installed in the AGCHO headquarters in Kabul that collects the data from all sites hourly, stores the data for future needs, retransmits some of it for local real-time GPS surveyors to use, compiles the data for transmission in various formats and then sends it to the NGS Web site, www.ngs.noaa.gov/CORS, for publication and distribution.

All this depends on local infrastructure, such as electrical power, Internet and cell phone service, which are often intermittent, causing temporary lapses in data streaming.

The mentor has the responsibility to ensure that the CORS sites are installed correctly and has travelled to some of the remote locations to work with the local AGCHO employees in cities such as Herat, Mazar-e Sharif and Maymanah.

In addition to the CORS network, the geodesy mentor provides other support to the AGCHO Geodesy Department, including training in surveying, geodesy, gravity collection, geoid modeling and the computation techniques for each. The mentor also works with the survey teams, at times providing on-the-job training in surveying and collection techniques and then computations in the office of all the data collected in the field.

Political Geography Mentor

A geography mentor from NGA's Political Geog-

graphy Division began deploying to AGCHO in 2008 with the unique mission of creating and developing a standardization program for geographic names in Afghanistan. This mission has many challenges, including vast linguistic diversity, illiteracy and recurring violence and instability. However, two years later, significant progress has been made.

The Board on Geographic Names for Afghanistan, or BGN-A, has been established to develop this standardization program in accordance with international standards. The first geographic names surveys conducted by Afghans have been conducted, and AGCHO has become increasingly recognized across the government of Afghanistan as the authority on geographic names.

The geography mentor conducts training for the Afghan cartographers on Romanization and names standardization, guides the processing of field survey results, guides the BGN-A on foundational matters, provides technical expertise, works with the geographers to develop a geographic names database and discusses systems, networking and software needs with the information technology department to create an infrastructure to support these efforts.

The geography mentor also attends meetings with other Afghan government offices to help foster cooperation across organizations.

Cartography Mentor

NGA also deploys a cartography mentor to AGCHO, with the mission of transforming an analog production system into a modern, digital, customer-oriented model. The mentor provides a wide variety of training, including fundamentals of cartography, data stewardship, feature extraction and attribution and large scale product finishing.

In 2009, NGA implemented an Image City Map pilot program with AGCHO that provided a year-long, intensive training curriculum to a core group of their high-performing cartographers. The pilot program focused on the "finishing" procedure for ICMs and served as both a vehicle for advanced

training and a mechanism for NGA to evaluate AGCHO's coproduction capabilities.

The demanding training constantly challenged the AGCHO cartographers, many of whom were being exposed to a computer for the very first time. However, the cartographers were diligent, enthusiastic students and successfully completed the pilot program in April 2010, finishing 20 Image City Maps along the way.

The AGCHO cartographers proved so eager that they agreed to assist NGA in fulfilling an International Security Assistance Force requirement for Afghanistan Image Maps, products very similar to ICMs. To date, AGCHO has 50 AIM sheets in production. These carry both the NGA and AGCHO seals and reflect the beginning of what will be a long and mutually beneficial relationship between these two agencies.

As time goes on, more relationships are cemented, trust is earned and partnerships are strengthened with the AGCHO offices. In addition, other coalition partners have seen the progress made by NGA and are also offering their support. AGCHO credibility is growing among the Afghan government agencies and forming partnerships. It is rewarding for NGA to witness AGCHO becoming a significant and viable resource within the government of Afghanistan. P

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Benjamin F. is a political geographer in the Political Geography Division in the Office of Targeting and Transnational Issues.

PARTNERSHIPS

FBI Cultivates GEOINT Capability

BY ROY CLARK

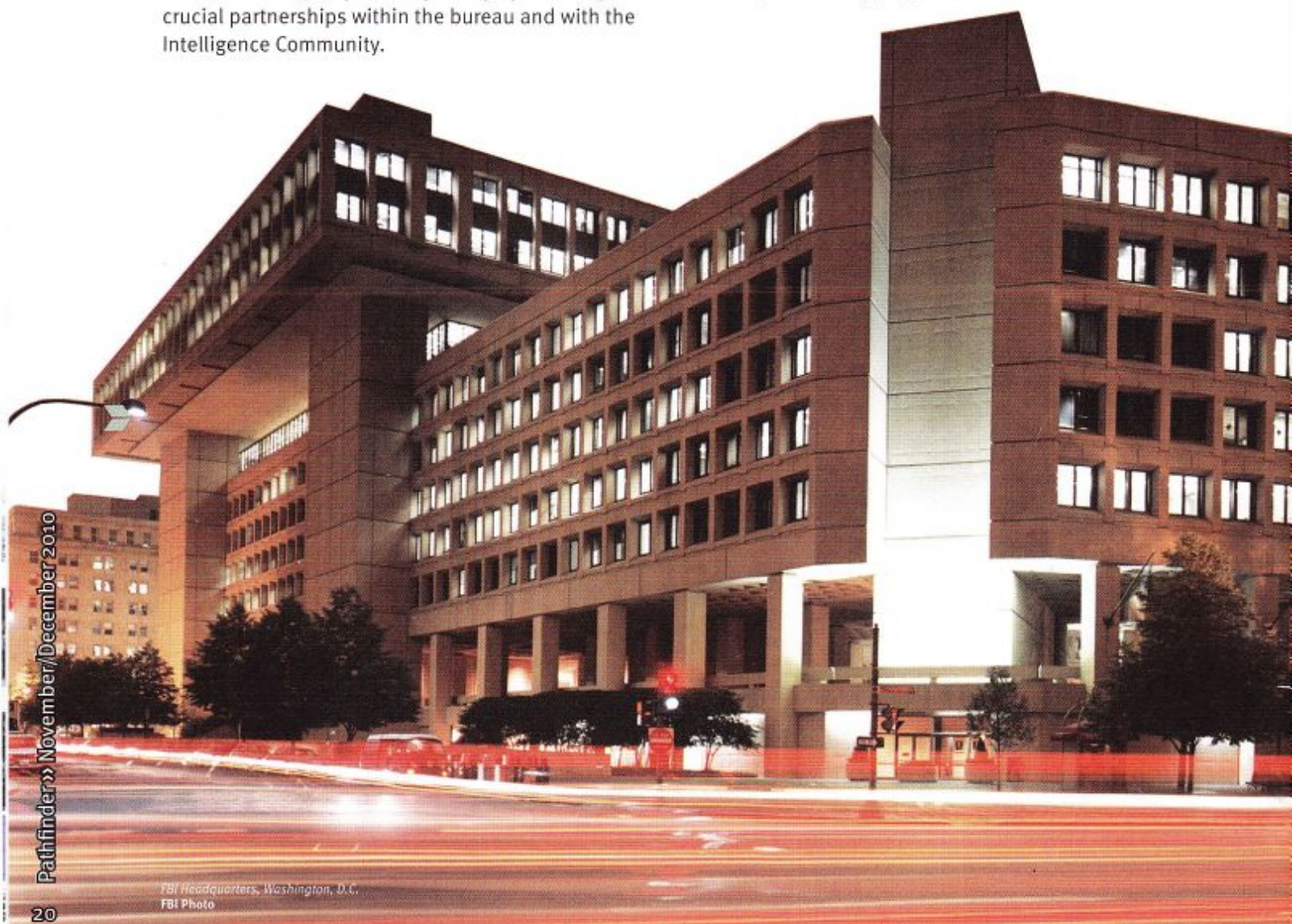
The FBI increasingly relies on geospatial intelligence to identify and address threats and vulnerabilities, using mapping tools, imagery, geospatial data and analysis to collect and analyze intelligence.

To coordinate and facilitate the growth of GEOINT in the FBI, the bureau's Directorate of Intelligence created the Geospatial Intelligence Unit in January 2009.

The unit has successfully established itself as a focal point within the FBI in the development of a bureau-wide geospatial capability by fostering crucial partnerships within the bureau and with the Intelligence Community.

As of September, GIU has trained more than 300 bureau personnel in all field offices on ESRI's ArcGIS, a sophisticated geospatial software application considered to be the standard in the law enforcement and intelligence communities. ArcGIS provides the capability for spatial analysis, data management and mapping.

The software displays relevant information for a specific geographic area, including critical infrastructure, crime patterns and human source coverage. For GIU, the goal is to provide employees with high-tech mapping tools to look at national



FBI Headquarters, Washington, D.C.
FBI Photo

security problems visually and geographically. With mapping technology, GIU can compare multiple data sets to advance investigations and analysis.

"There are three important things about geospatial intelligence—data, data and data," said Supervisory Special Agent Jason Richards, a GIU employee and former attorney who joined the FBI in 2005.

"Every data set has some geographic component to it, whether it is an address, GPS location, route or surveillance log," said Richards. "Geospatial software provides a really good fusion platform for that information. I could have signals intelligence, electronic intelligence, tracking info, as well as intelligence with a national security context, and I could bring them together with the GEOINT software and start to see possible relationships. It's hard to do that with a spreadsheet."

On the strategic level, mapping enhances domain awareness and reveals connections among cases that GIU might not otherwise notice. On the tactical level, mapping criminal activity and overlaying it with the addresses of parolees on a map, for example, points to doors the FBI can knock on and persons who can provide the bureau with information to solve crimes or enhance investigations.

Intelligence Community

The GIU is also redeveloping iDX3, formerly iDomain, a customized version of Palanterra, an online mapping system designed by the National Geospatial-Intelligence Agency to describe, assess and depict physical features and GEOINT for homeland security operations.

"Everyone can use it across the bureau to satisfy geospatial requirements. It's a Web-based tool," Richards said.

The bureau works seamlessly with NGA in efforts to build GEOINT capability. For example, GIU helped the bureau's National Security Branch bring over the NGA manager who developed Palanterra on assignment as an iDomain executive-level program manager. In addition, the FBI's 2010 budget

included funding for intelligence analysts to attend GEOINT classes and visit NGA facilities.

"We actually have NGA analysts on its [NGA] Support Team to FBI who are assigned throughout the bureau. There are analysts who are embedded in our unit from that support team," Richards said. He added that the NGA analysts are limited in what they are allowed to do because of Intelligence Community restrictions, which is why the FBI needs to train its own personnel.

FBI

The GIU also works with many other successful GEOINT programs in place at the FBI, including Project Pinpoint, a simple-to-use, computer-based program that combines mapping software with intelligence data, such as crime locations and patterns, felony warrants and cell phone patterns.

Created by the Safe Streets Task Force of the FBI's Philadelphia Division, Project Pinpoint allows law enforcement to identify sources of information and develop tips. It integrates existing police, court and FBI records into an off-the-shelf street-map program that allows the bureau to combine and visually map crime data from a multitude of agencies—everything from shootings and human source coverage to outstanding warrants and open investigations.

As these successful partnerships attest, the FBI's GIU has, in less than two years, driven the bureau's growing cultivation of GEOINT applications for law enforcement.

"We have analysts in our unit who are skilled in powerful geospatial software, and we are building that cadre to not only be the experts to build products for the bureau, but also to be experts that the field [offices] can rely on for their particular GEOINT concerns," said Richards. ▢

▮ Roy Clark works in the FBI Office of Public Affairs.

PARTNERSHIPS

Agency Lays the Foundation of Enterprise Architecture for Future U.S. Korea Command

BY DR. ROBERT N. AND ROBERT S.

A key mission for the National Geospatial-Intelligence Agency is to advocate for interoperability and information sharing among its international partnerships. A good example is NGA's initiative to develop the geospatial intelligence enterprise architecture for the major ongoing restructuring of the military relationship between the Republic of Korea and the United States to make sure the information technology requirements remain aligned with the mission after the transition.

By December 2015, the South Korean military will assume wartime control of its own troops, U.S. Forces Korea will have completed its transformation into the U.S. Korea Command, and the current ROK-U.S. Combined Forces Command will be dissolved.

The new KORCOM will support the ROK military in defending its nation and continue to be an extended U.S. presence within northeast Asia to maintain peace and stability throughout the region.

Since the ROK forces will no longer be under a combined command, a major objective of NGA's enterprise architecture effort is to ensure interoperability with ROK GEOINT data. Making NGA's information and data available to the entire production community on the peninsula will increase the quality and quantity of geospatial products.

Geospatial information and data from a number of disparate sources will be accessible to GEOINT partner organizations whenever they need it. In addition to increasing accessibility to information and data, the resulting GEOINT products will be made available to consumers both on and off the peninsula: operators, warfighters, planners, targeteers, policy makers, decision makers and senior leaders.

The agency anticipates challenges to achieving the command's GEOINT goals from the information technology, resource and policy perspectives. NGA has enlisted the full support of its relevant offices and directorates, as well as the U.S. Forces Korea and U.S. Pacific Command NGA Support Teams to address these challenges.

A key aspect to successfully developing this integrated GEOINT enterprise architecture will be data and data management. Therefore, adherence to known commercial and military formats and GEOINT standards is essential for interoperability and information sharing. Standards are vital as they ensure all the data collected will be readily available when needed.

All systems and participants must collect and tag information in a consistent manner so that GEOINT production centers on the peninsula are able to share the information among themselves.

The Enterprise Architecture and Standards Office has already begun working with both Korean and U.S. participants to address data formatting standards issues. All stakeholders now have a collective understanding of the importance of meeting standards.

Other important aspects that will need to be integrated include naming conventions, metadata standards, search and retrieval tools, and the ability to store, move and process increased amounts of GEOINT data.

KORCOM's future enterprise architecture will provide its partners with a system that enables them to engage in collaborative planning for both routine and crisis scenarios of mutual interest. It will also provide a shared mechanism that will enable each nation to manage its own prioritized collection, analysis and production program in a manner that is transparent to both producers and customers. P

Dr. Robert N. is the director of the Enterprise Architecture and Standards Office in the Office of the Chief Information Officer.

Robert S. is an enterprise architect in the Enterprise Architecture and Standards Office.

GUEST COLUMN

Successive Directors Shape NSG

BY PAUL R. WEISE

The responsibility for geospatial intelligence functional management recently transitioned to the leadership of a new functional manager. In August, the National Geospatial-Intelligence Agency welcomed Director Letitia A. Long, who reiterated her support for the National System for Geospatial Intelligence and her goal to increase the benefits of functional management throughout the NSG membership.

The NSG focuses on building the geospatial capacity of the United States and leading the global GEOINT community through investments, standards and training. Since its formal establishment in 2007, the NSG has promoted GEOINT as a discipline with functional management as the most effective tool for unifying a geographically and bureaucratically diverse community.

Successive NGA directors stamped their mark on functional management. Current Director of National Intelligence James R. Clapper Jr., NGA Director during 2001-2006, presided over the informal creation of the GEOINT community and many of its leading structures. Vice Adm. Robert B. Murrett, NGA Director during 2006-2010, formalized these structures and, with the Under Secretary of Defense for Intelligence and the DNI, promoted functional management as a viable method to organize the intelligence disciplines into communities of common concern.

Now, Director Long will help evolve the NSG into a community whose cooperation and collaborative drive deliver benefits to all members.

Successful intelligence is based on a holistic approach, and GEOINT provides a steady foundation for this success by providing location and visual dimensions to the intelligence picture; the growing worldwide demand, by both mission partners and allies, for geospatial information and systems demonstrates the value of GEOINT. The NSG coordinates the U.S. government and its allies' approach to GEOINT, ensuring that efforts are not duplicated, investments are not wasted, and each member works in tandem with the larger community.



The present and past two National Geospatial-Intelligence Agency directors at the Aug. 9 transfer of authority ceremony at NGA Campus East, Springfield, Va. From right, NGA Director Letitia A. Long, Vice Adm. Robert B. Murrett and Director of National Intelligence James R. Clapper Jr.

NGA Photo

But there is still much work to be done. Complex issues remain with full-motion video, data storage and product dissemination, but working together under the NSG makes these challenges more manageable. The NSG's GEOINT partners, including academic and industry associates, continue to drive developments in the discipline's knowledge base and technology, but the NSG must collectively do a better job of integrating those improvements into a multi-user architecture.

As NGA and the NSG progress, the benefits of GEOINT functional management are becoming more tangible. As new applications for GEOINT are discovered and shared, the unified NSG community continues to realize cost savings, performance improvements and advanced capabilities.

The NSG values all its members, partners and associates—all play a critical role in the future success of GEOINT. **P**

Paul R. Weise is the chief functional management officer for the National System for Geospatial Intelligence. He is also the director of NGA's Office of Geospatial-Intelligence Management.

National Geospatial-Intelligence Agency
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