

THE NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Vol. 6 No. 2

# PATHFINDER

THE GEOSPATIAL INTELLIGENCE MAGAZINE  
— SERVING THE FRONT LINE —

MARCH/APRIL 2008



QUAD GEOINT BENEFITS  
THE DIGO MISSION



GEOINT PRODUCTS AID  
DISASTER RECOVERY IN  
LATIN AMERICA

Strengthening NGA  
**PARTNERSHIPS**  
Around the World

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>APR 2008</b>		2. REPORT TYPE		3. DATES COVERED <b>00-03-2008 to 00-04-2008</b>	
4. TITLE AND SUBTITLE <b>Strengthening NGA Partnerships Around the World (Pathfinder, March/April 2008)</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>National Geospatial-Intelligence Agency, Office of Corporate Communications, 4600 Sangamore Road, Bethesda, MD, 20816-5003</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>28</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			



## ON MY MIND

# International Partnerships Make the GEOINT Difference

The Director of National Intelligence recently issued guidance and emphasized the need “to enlist the cooperation and assistance of foreign partners.” The Intelligence Community, as a whole, must collectively strengthen our foreign intelligence relationships and expand collection and analytic collaboration. NGA’s Focus Area to “build new and enhance enduring international partnerships” demonstrates the importance we have placed on this issue. We are leveraging the expertise and capabilities of our foreign partners as force multipliers to meet global security challenges. Finding new ways to expand existing partnerships, as well as establishing new relationships, broadens our analytic capabilities, deepens our expertise and adds valuable context and perspective to various programs.

## Enhancing Enduring International Partnerships

Our collaborative relationships with our Commonwealth allies—Australia, Canada and the United Kingdom—have always been strong and are continuing to grow. Bringing our best practices and different viewpoints together to the analytic part of our business gives us each a richer understanding of specific problems and threats. This collaboration offers both NGA and our Commonwealth partners analytic options and surge capabilities to complement in-house resources in times of national crisis. Some of our more successful endeavors have been in the areas of disaster response, homeland security and special security events.

A recent success story is the Asia-Pacific Economic Cooperation (APEC) Summit held in Sydney, Australia in 2007. Over twenty heads of state attended the conference, requiring a multinational security response. NGA deployed seven personnel to assist the Defence Intelligence Geospatial Organisation (DIGO) staff in using the Palantir™ Common Operating Picture to provide more seamless situational awareness. GEOINT support packages were produced for protective operations for President Bush and other delegates’ visits to the summit. This collaboration and the exchange of GEOINT methodologies were viewed as a “hallmark of collaborative success” and will be used as a model for similar future events.

## Building New International Partnerships

NGA is investing in developing new international partnerships that can augment NGA analysis and increase our flexibility to focus more resources on the hardest targets. This investment has become increasingly more important due to the growth of coalition activities in response to changing world situations, evolving international threats and the expanding globalization of GEOINT.

Last year NGA hosted approximately 300 foreign visitors from 25 to 30 different countries at NGA facilities and at the same time reached out to numerous foreign partners. With the rapid expansion in GEOINT applications across the globe, the more we can share the data burden, the more we reduce duplication of efforts. Multinational cooperation increases the return on data investments for all, developing a mutually beneficial collaborative environment. For example, U.S. forces can receive enhanced GEOINT, such as more accurate place names, resulting from co-production agreements. Conversely, a foreign partner can be better prepared to respond to any contingency through the use of data gained through a partnership with NGA.

International partnering is making a critical difference in the ongoing war against violent extremism as well as in disaster and humanitarian relief efforts. NGA is at the forefront establishing standards and providing leadership in shaping this “global GEOINT community.” These efforts on data standardization and sharing by NGA and its allies ensure that our intellectual output can be applied for the collective good of this international GEOINT community. This raises the readiness for national security for all of our partnering nations.

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



## CONTENTS

- 2** Letter to Our Readers
- 3** Guest Column: Benefits That Quad GEOINT Brings to the DIGO Mission
- 5** Up Front: Collaborating With a World of Partners
- >> FEATURES**
- 7** Vice Adm. Murrett hosts Maj. Gen. Cobelens of the Netherlands
- 8** NGA and Mongolia Map New Horizons
- 10** Norway Demonstrates World-Class GEOINT
- 12** GEOINT Products Aid Disaster Recovery in Latin America
- 13** Assistant Secretary of State Commends NGA for Annapolis Support
- 15** NGA Supplies Digital Aeronautical Data Access for Foreign Partners
- 16** NGA Forges Support for USAFRICOM
- >> DEPARTMENTS**
- 18** Partnerships: NGA Welcomes New German Geospatial Liaison
- 19** Working for NGA: Keeping an Eye on GPS Station Ecuador
- 21** Our Heritage: Commonwealth Friendships Stand the Test of Time
- 23** In Closing: Pathfinder Editor Moves On



5



8



19

### ON THE COVER

The continents on the map stretch into the distance, indicating the world-wide scope of NGA's international partnerships. The two-dimensional map gives way to crests and valleys suggesting the Earth's varied topography and how geospatial intelligence reaches above and below the planet's surface. The edge of the map represents the ever-expanding edge of geospatial knowledge—just as archaic views have evolved to an ever fuller appreciation of the Earth's dimensional breadth. This issue of the Pathfinder highlights how NGA's valuable foreign partners play an integral role in expanding geospatial understanding, from the Commonwealth to Latin America and across the globe. Vincent Gaines designed the cover.



## LETTER TO OUR READERS

# Strengthening Partnerships Around the World

As the importance of geospatial intelligence (GEOINT) expands throughout the world, the security of our nation and of our allies is well served by our foreign partner relationships. By “strengthening partnerships around the world,” the theme of this issue, NGA reinforces the ability of the United States and its allies to protect freedom around the globe. Several of the agency’s foreign partnerships are explored in these pages.

In a guest column, Clive Lines, Director of Australia’s Defence Imagery and Geospatial Organisation (DIGO), discusses several of the GEOINT benefits that our Commonwealth relationships provide. Our collaboration with the Multinational Geospatial Co-production Program and our cooperation on responding to Hurricane Katrina are two examples that illustrate the value of our relationship with DIGO. “Our Heritage: Commonwealth Friendships Stand the Test of Time” adds further historical references to these longstanding relationships.

Dawn Eilenberger, Director of NGA’s Office of International Affairs and Policy, shares her perspective on our international partnerships and their significance to our country’s national and international interests. As she explains in “Up Front: Collaborating with a World of Partners,” the global expansion of GEOINT and the resulting burden sharing of GEOINT responsibilities increases our ability to support mission-critical objectives.

“Norway Demonstrates World-Class GEOINT” ably describes the solid GEOINT contributions of this Scandinavian partner, which reach from pole to pole. “GEOINT Products Aid Disaster Recovery in Latin America” details many of NGA’s significant efforts to mitigate suffering in that region.

As illustrated by “NGA Forges Support for USAFRICOM,” the agency’s establishment of a team augmenting the recent standup of the U.S. Africa Command reflects our nation’s pledge to bolster our country’s African partners. “NGA Welcomes New German Geospatial Liaison” provides dynamic evidence of how the agency continues to invigorate our vital international partnerships.

Finally, in this issue we express our warm respect and best wishes to Paul Hurlburt upon his retirement in 2007 from the position of Pathfinder editor. For 25 years, he capably served readers, significantly shaping the Pathfinder and its predecessor publications. His contributions will be missed.

Our May/June issue will focus on the contributions of GEOINT and NGA’s leading role within the broader Intelligence Community.



  
PAUL R. WEISE

Director, Office of Corporate Communications

# PATHFINDER

Published by the National Geospatial-Intelligence Agency  
Office of Corporate Communications  
Internal Communications Branch (OCCEI)  
4600 Sangamore Road, Mail Stop D-54  
Bethesda, Maryland 20816-5003  
Telephone: (301) 227-7388,  
DSN 287-7388, or  
In St. Louis: (314) 676-9082,  
DSN 846-9082  
E-mail: [pathfinder@nga.mil](mailto:pathfinder@nga.mil)

## DIRECTOR

Vice Adm. Robert B. Murrett

## DEPUTY DIRECTOR

Lloyd Rowland

## OFFICE OF CORPORATE COMMUNICATIONS, DIRECTOR

Paul Weise

## PRINCIPAL DEPUTY DIRECTOR

Kimberly A. Thompson

## DEPUTY DIRECTOR FOR GEOINT COMMUNICATIONS

Art Haubold

## STRATEGIC COMMUNICATIONS BRANCH, CHIEF

Louis Brune

## EDITOR

Jason K. Michas

## MANAGING EDITOR

Jennifer Harris

## VISUAL COMMUNICATIONS BRANCH, CHIEF

Armand Boyd

## GRAPHIC DESIGNER

Carmella Bender

## CONTRIBUTING AUTHORS

Chuck Boyer

Gail Cherchak

April Choi-Pawlowski

Heather Cox

Dawn Eilenberger

Eduardo Elinan

Juanita Hartbarger

Jack Hild

Margaret Jorgensen

Mike Kieswetter

Clive Lines, Director, Defence Imagery and Geospatial Organisation

Melissa Planert

Sharon Stanish

Randall Taylor

John Tomasovich

Dr. Gary Weir

Heidi Whitesell

## GETTING PUBLISHED

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

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

## GUEST COLUMN

# Benefits That Quad GEOINT Brings to the DIGO Mission

BY CLIVE LINES, DIRECTOR, DEFENCE IMAGERY AND GEOSPATIAL ORGANISATION

**Editor's Note:** The Defence Imagery and Geospatial Organisation (DIGO) is the lead geospatial and imagery intelligence organization in the Australian Department of Defence. DIGO provides geospatial intelligence, from imagery and other sources, in support of Australia's defense and national interests. The United States, Australia, Canada, and the United Kingdom, which form the Quadripartite (Quad) Committee, share unique and special relationships concerning the sharing of geospatial intelligence (GEOINT). The Pathfinder invited Mr. Clive Lines, Director, DIGO, to share with our readers his insight on the Quad relationships.

DIGO was formed under an Australian Government directive on Nov. 8, 2000, by joining three agencies: the Australian Imagery Organisation, the Defence Topographic Agency, and the Directorate of Strategic Military Geographic Information. Each of these organisations already had well-established relationships within the Quad. These relationships have continued to grow and strengthen, particularly as the Quad Governance framework has matured. So, while DIGO as an organisation has only just celebrated its seventh birthday, our functions, and particularly our Quad relationships, have a long and rich history dating back many years.

One of the most tangible outcomes of our Quad membership is our involvement in the Multinational Geospatial Co-production Program (MGCP). The MGCP's aim is to produce high-resolution geospatial data around the world. While 28 nations are involved in MGCP, the Quad members are four of the 11 lead nations in the project. As lead nations, the Quad will have access to all the data that

is produced. In addition to the obvious benefits of the MGCP, our involvement also provides opportunities for collaborative analytical engagement both with the Quad and other MGCP members.

MGCP is just the tip of the iceberg as far as



Photo courtesy of DIGO

Clive Lines, Director, DIGO

collaborative engagement with the Quad is concerned, though. Other engagements include daily updates with our 24/7 watch facilities, regular analyst-to-analyst liaison and, where practicable, meetings in person, as well as conference and seminar participation. The benefits to all Quad members include the sharing of knowledge with regard to sources and methods, as well as the sharing of tradecraft and training.

Training is one of the greatest benefits DIGO achieves from our Quad relationships. In 2007 DIGO commenced its inaugural in-house imagery training program. This program could not have been realized without the support of our Quad partners. Our training team drew on the experience of all the Quad members in developing the program, and our Canadian partner very generously loaned us an instructor for the inaugural course. We have just completed our second course, and the feedback from students and managers has been very positive.







Recent collaboration for the Asia-Pacific Economic Cooperation (APEC) 2007 meetings is another great example of the benefits of the Quad relationships. APEC 2007 culminated with the APEC Economic Leaders Week, which was held in early September 2007 in Sydney. With 20 heads of state attending, there was much work done to prepare for the events. DIGO support to APEC was a multinational effort, including seven NGA personnel who were deployed in support of the joint operation. NGA staff assisted DIGO in demonstrating the Palanterra™ Common Operating Picture. With so many state and federal agencies conducting their own discrete operations simultaneously, it is essential to maintain situational awareness during these events. Traditionally, this is achieved through exchange of reports and face-to-face briefings at various times of the day. Palanterra™ was developed by the NGA's Special Security Events team to assist in providing more seamless situational awareness. As a web-based technology, Palanterra™ can be modified to meet the specific needs of commanders and operators providing special

security support to events such as APEC. Palanterra™ was so well-received by Australian security and defence organisations that it is now the subject of formal capability development efforts.

DIGO was also able to assist NGA in its response to Hurricane Katrina through the provision of an analyst for a month. DIGO's analyst drew on his experience in working on the Australian Government's response to the devastating Southeast Asian tsunami in December 2004.

We have separately contributed a range of unique Australian capabilities to the partnership. Our close proximity to the Defence and other government agencies in Australia also enables us to trial and demonstrate new collaborative techniques and products. Some of those unique products include facility maps, shipping watch reports, wide-area maritime surveillance (in collaboration with the United States and Australia's Defence Science and Technology Organisation), and a rapidly expanding array of products providing context to other agency reporting. P



*Devastation in Indonesia attests to the destruction of the 2004 Southeast Asian Tsunami. DIGO analysts assisted Australia's response to the disaster.*  
DoD photo by PH1 Alan D. Monyelle, U.S. Navy



UP FRONT

## Collaborating With a World of Partners

BY DAWN EILENBERGER

**Forging relationships with foreign partners has** become more important as the globalization of geospatial intelligence (GEOINT) changes the way the United States responds to a wide array of situations on the world stage. From coalition forces fighting the war on terror to first responders supporting disaster relief, it is clear that NGA's relationships with its international partners support core mission requirements.

Collaboration in a coalition environment is one avenue of support, but it must be emphasized that our international partners have a tremendous wealth of assets to provide against a spectrum of intelligence issues. From agreements to share commercial imagery, to the ability to enhance NGA analysis, the agency is literally spanning the globe in collaborative efforts.

### A Changing Global Landscape

The world of GEOINT has never been larger, more dynamic or

more complex. Each passing month sees a news headline announcing that another country has broken into the satellite imagery collection arena. The past decade has seen an explosion in the number of countries that have entered into what was once a near-U.S. monopoly in imagery collection and analysis.







Commercial space systems are also on the rise, adding a new dimension to the way we can view the world around us. The new reality is that NGA is not alone as a collector, provider and analyst of GEOINT.

### **Agreement Expansion and Increased Opportunities**

The expansion of GEOINT can be seen in virtually every corner of the globe. NGA has entered into formal arrangements with over 120 countries worldwide—equating to over 400 agreements. NGA is working in every region of the world to forge partnerships that can build capacity to enable international partners to operate in coalition environments, transform and modernize their defense structures, and protect common interests.

This new and robust GEOINT environment gives NGA and the nation increased opportunities to support critical mission areas. Burden sharing of GEOINT responsibilities is a win-win relationship for foreign partners and the United States. As NGA strives to improve the quality, timeliness and cost of GEOINT products, data and analytic exchanges enhance and add different insights and texture to common problems.

Nowhere is the value of shared geospatial responsibility more apparent than within the Multinational Geospatial Co-production Program (MGCP)—an agreement among 28 member nations to produce digital vector data over some very important regions of the world. Each country individually benefits from data sharing, and the stipulation to also share with NATO allows NGA to bring a unique arrangement to bear that supports U.S. national security interests.

### **Benefits and Risks**

While the number of relationships with international partners continues to grow, NGA must weigh the benefits and the resources required to support a relationship with the return that can be gained from such an investment. As part of the NGA Focus Area on building new international partnerships, an effective approach was developed that applies a set of evaluation criteria in deciding whether to pursue a new partnership initiative.

The ability to provide key source data or to support production and analysis in critical mission areas weighs heavily in evaluation decisions. The evaluation criteria also address contributions to broader foreign policy objectives. Coupled with considerations of costs and potential risks, the criteria ensure that NGA senior leaders share

a common vision for a particular country, as well as for the support that NGA has agreed to provide as a result of that formal relationship. Each decision must be carefully weighed to ensure consistency with the international priorities of the Director of National Intelligence and Department of Defense.

### **The Payoff for International Collaboration**

Examples of collaboration are not hard to find. In 2007, the Asia-Pacific Economic Cooperation (APEC) Summit was held in Sydney, Australia. This event required the combined efforts of mission partners in Australia along with NGA to produce the GEOINT support packages for protective operations for President Bush's visit to the summit. The results of this collaboration and the exchange of GEOINT methodologies were viewed as a hallmark of success.

Our Commonwealth partners (Australia, the United Kingdom, and Canada) have contributed people who have been integrated into NGA production and who are working towards increased collaboration and analysis against hard problems. It is always important to bring best practices and different views to the analytic component of our business. When we exchange these different insights and challenge our perspectives with new thought processes, we gain a richer understanding of a particular problem or threat. Additionally, we are advancing toward an environment where common operating procedures help streamline the way we do business and enhance production in instances where we must operate in a coalition environment with our international partners.

The contributions of NGA's international partners are so diverse. Partnering with foreign experts in GEOINT not only makes good sense, it helps us expand the way we confront challenges and understand the world around us. P

#### **DAWN EILENBERGER**

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



# Vice Adm. Murrett Hosts Maj. Gen. Cobelens of the Netherlands

BY MELISSA PLANERT AND MIKE KIESWETTER

**Building international rapport is vital to establishing enduring partnerships.** These partnerships benefit the United States and its allies by allowing each country to bring its strengths to the table to accomplish mutual goals. One way to encourage these relationships is via counterpart visits. In December 2007, NGA Director Vice Adm. Robert B. Murrett, U.S. Navy, hosted Maj. Gen. Pieter Cobelens, the Director of the Defense Intelligence and Security Service (DISS), Kingdom of the Netherlands. Lt. Col. Peter Loukes, Maj. Bonnette Hunting van Zuijlen, and Capt. Minne Ayzo Boelens accompanied Gen. Cobelens on his visit.

The Netherlands Ministry of Defense is considering the establishment of an “NGA-like” organization to combine geospatial and imagery specialties into geospatial intelligence (GEOINT). NGA has been a leader in GEOINT and felt honored to provide information to help this key ally achieve its goal.

The Netherlands is an important partner in the Global War on Terror. Among its many contributions is its strong support to the war in Afghanistan. It has taken an active leadership role commanding Regional Command South and providing troops to assist with security and reconstruction. NGA welcomed the opportunity to learn from the Netherlands’ experiences and to thank its officials for their country’s steadfast commitment to the war effort. The visit also showed NGA that there are opportunities for further discussion and cooperation on a global scale between the DISS and NGA.

The five-day visit included office calls with the Under Secretary of Defense for Intelligence, the Principal Deputy Director for National Intelligence and the Directors of the Central Intelligence Agency, Defense Intelligence Agency, National Security Agency, and NGA. This provided the U.S. Intelligence Community with a superb opportunity to strengthen ties and discuss mutual goals and concerns.

The NGA Office of International Affairs and Policy (OIP) hosted several days of orientation at both NGA East and West sites. Discussions centered on the mission, organization, and unique products and services NGA provides to support multiple domestic and international partners. NGA shared the growing pains experienced in establishing GEOINT as a discipline over the last decade and the benefits that have come as a result. The extraordinary diver-



Photo by Rob Cox

*NGA Director Vice Adm. Robert B. Murrett presents a map of the Netherlands to DISS Director Maj. Gen. Pieter Cobelens.*

sity of the NGA mission was showcased, and examples of support to the warfighters were emphasized.

Finally, NGA spotlighted the important partnerships with corporate partners DigitalGlobe and GeoEye. Both companies provided an orientation to their operations and information on their agreements with NGA. Another highlight of the tour was a visit to Ball Aerospace, providing the delegation with the opportunity to see satellites in production.

Spending the entire week with the director of a foreign intelligence service was a tremendous opportunity to gain fresh perspectives and insights into a wide variety of issues as seen through the eyes of a close international partner. As NGA goes forward to strengthen ties with the Netherlands, this successful visit renewed and enhanced the understanding of each other’s missions and goals. Most importantly, NGA has built a bridge between the senior leaders of two organizations that will serve well in a partnership focused on support to the warfighters of both nations. P

**MELISSA PLANERT AND MIKE KIESWETTER**

are Staff Officers in NGA’s Office of International Affairs and Policy.





# NGA and Mongolia Map New Horizons

By MARGARET JORGENSEN AND CHUCK BOYER

**Due to Mongolia's strategic location, NGA's** geospatial requirements in the region, and the Department of Defense's increasing activity in the region, NGA has been actively working with the young democracy for the exchange of geospatial products and services. Since NGA first entered into an exchange and cooperative agreement with Mongolia in 2004, its relations with their government have grown to include Mongolia's Ministry of Construction and Urban Development, the General Staff of the Armed Forces of Mongolia, the National Emergency Management Agency, and the Border Protection General Board of Mongolia.

Mongolia is considered by some to be a vibrant, if fragile, democracy that has accomplished much in the past two decades since its almost 70 years under communism.

With its large land mass, small population, and numerous natural resources, Mongolia's economy grew at

an annual rate of 8.6 percent last year. It is strategically positioned between Russia and China and is touted as an outstanding global citizen, as evidenced by its status as a nuclear weapons-free zone and strong support of international peacekeeping efforts. Mongolia provides peacekeeping support in Afghanistan and Iraq, and since 2002, also regularly rotates its troops to United Nations missions in Africa (Sierra Leone) and the Balkans (Kosovo). Furthermore, Mongolia continues to host the Khaan Quest, an annual multinational peacekeeping exercise that has up to 30 different countries participating or observing.

## How NGA Benefits

Detailed gravity and elevation data over Mongolia are helping NGA's GEOINT Sciences Office develop a highly accurate geoid model, the vertical reference surface that closely approximates mean sea level over the continents. In addition to conducting airborne gravity surveys in Mongolia, an absolute gravity survey of five diverse sites throughout the country was conducted that assisted NGA in maintaining World Geodetic System 84, the global horizontal reference system. All of these efforts work together to provide improved geospatial intelligence (GEOINT)

support to NGA's customers, especially in the areas of precision inertial navigation and low-earth orbit modeling. NGA has also received Mongolia's geographic names database and copies of the latest 1:50,000-scale map products of the Five Hills Training Center in Mongolia, which were created using NGA source data.

*At 90 feet tall, a gold-plated Buddhist statue towers within a monastery in Ulaanbaatar, Mongolia.  
Photo by Tim Bramstedt*



## Payoff for Mongolia

A precise geoid model benefits the Mongolians, too, as it allows them to properly reference vertical feature data. Furthermore, four Mongolian agencies received loaned geographic information system (GIS) workstations from NGA that will give them a basic digital geospatial analysis and exploitation capability. Additional training will aid them in creating products that meet NGA standards and specifications.

In June 2007, Chuck Boyer, an International Affairs and Policy staff officer, led an NGA delegation of seven employees to Mongolia. They met with NGA's four most recent agreement partners plus Mongolia's National Defense University, the State Police, the General Intelligence Agency, and the Civil Aviation Authority. Accomplishments of the visit ranged from discussing additional cooperative projects, checking on the status of the GIS workstations that are on loan from NGA, conducting GeoNames (geographic names) training, and holding initial discussions about a safety of flight navigation Memorandum of Understanding. A highlight of the visit, and one that shows the value the Mongolians place on their relationship with NGA, was the presentation of the "Leading Expert in Land Affairs in Mongolia" award to Steve Kenyon, of NGA's GEOINT Sciences Office, by Mongolia's Minister of Construction and Urban Development. This was the first time this award was ever bestowed on a foreign national.



*Guard Towers overlook a model 13th century Mongolian village.*



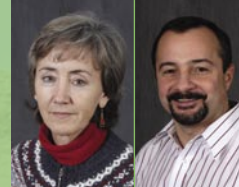
*A reproduced Buddhist spirit ring surrounds a center prayer area.*

## What's Next

In fiscal year 2008, NGA plans to conduct a gravity survey in an extremely remote and void area of northern Mongolia, which will continue to improve the geoid and provide improved topographic modeling of the country. Other potential projects being considered include geographic names and training. NGA's relations with Mongolia continue to progress, coinciding with Department of Defense and State Department increased activities in the area. P

### MARGARET JORGENSEN AND CHUCK BOYER

are Staff Officers in the Office of International Affairs and Policy.







# Norway Demonstrates World-Class GEOINT

By JACK HILD

**Latitude 79° north.** Just an imaginary line in an ancient cartographer's head, and yet, as NGA representatives crossed it, all eyes were glued to their GPS display. This visit to the geodetic ground station in Ny-Ålesund, Norway, in the Svalbard Archipelago, was the last day of a 2007 "winter in August" trip that included nearly every aspect of geospatial intelligence (GEOINT) demonstrated by NGA's Norwegian partners.

Members of NGA's Office of International Affairs and Policy, Source Operations and Management Directorate, and Commercial Remote Sensing Program began the trip in Oslo with a review of NGA's bilateral and co-production activities that support the National System for Geospatial Intelligence (NSG) and the requirements of our allies. Norway supports its deployed forces and, like NGA, gives them top priority.

Norway also acts as the procurement executive on behalf of Denmark, Sweden and Finland for the Nordic contribution to the Multinational Geospatial Co-production Program (MGCP). In that role, they are the largest producer in the MGCP community and an influential leader of the program. With funding, standards and a production plan in place, these Nordic countries are extracting geospatial content over priority areas extending from the Arctic Ocean to Afghanistan.

## Time Dominant Operations

Heading two hours north to Tromsø (69° N) on the second day of the trip, the NGA representatives visited the headquarters of Kongsberg Satellite Services, or KSAT. Owned by the Norwegian government and Kongsberg

Defence and Aerospace Acquisition System, KSAT provides ground station services for over 30 government and private sector polar orbiting satellites that include communication, weather and imaging sensors.

In addition to operating ground stations, KSAT provides time-dominant services for oil spill, ice and ship detection. These commercial applications of GEOINT analysis are evidence of a growing demand for near-real time support. In their oil spill detection service, KSAT analysts review commercial synthetic aperture radar imagery for possible oil slicks and, upon detection, notify law enforcement and environmental authorities within 30 minutes of imaging. This service is available throughout European coastal waters. Emphasizing their sense of urgency in this mission, their motto is "No one is interested in yesterday's oil spill."


A second time-dominant service being offered is ice tracking in Arctic and North Atlantic waters. Using low bandwidth communication, KSAT disseminates near-real time imagery to fishing and shipping fleets to provide situational awareness of ice conditions.

## Location, Location, Location

Traveling two more hours north, the NGA visitors arrived at the Svalbard Archipelago. There, the town of Longyearbyen (78° N) hosts the majority of the KSAT antennas. Operating 24/7 year-round, this station downloads data and uploads instructions 14 times per day per satellite. Owing to its location, climate and professional staff, KSAT has not missed an operation in 10 years, a remarkable record of providing quality service. To illustrate the importance of location, KSAT has just opened an additional site in Troll,

*A survey antenna in Ny-Ålesund, Norway, accents the imposing landscape of the Svalbard Archipelago.*  
Photo courtesy of OIP





Antarctica, almost due south of Longyearbyen, giving them pole-to-pole coverage as well as significant growth opportunities as the polar orbiting constellation grows.

### The Lesson

Overall, the NGA visitors took away three key points. First was the professionalism and commitment of their Norwegian hosts who briefed and demonstrated high-end GEOINT capabilities. Some may consider Norway a geographically small nation, but their diverse competencies in GEOINT and related fields are world-class. Second was the performance record of KSAT—a highly efficient, no-frills operation achieving outstanding results. Third were the commercial applications for time-dominant GEOINT.

Only time will tell how widespread this use of GEOINT will become, and it will be interesting to observe the evolution. As this visit to Norway demonstrated, one thing is certain: the next generation of NGA GEOINT analysts will exist in a vastly different professional environment. It will be global, it will be technical and it will move fast. ▢

#### JACK HILD

a former NGA cartographer, is currently serving as Deputy Director of the Source Operations and Management Directorate.





# GEOINT Products Aid Disaster Recovery in Latin America

BY EDUARDO ELINAN

**NGA responds** when disaster strikes, locally or globally, and is the world's leading agency of its kind, with international partners circling the globe.

Partnerships with counterpart organizations in Latin America since the early 1940s allow NGA and its partners to operate efficiently within the geospatial disciplines. Partnership, however, can grow to be more than adherence to the agency's legal obligations as stated in the Basic Exchange and Cooperative Agreements that NGA maintains with its partners in Latin America. An example of collaboration is how NGA responded to assist in mitigation of a wide range of natural disasters in Latin America.

Throughout 2007, NGA was presented with numerous requests for prompt and responsive support to facilitate planning and mitigation of natural disasters in Latin America. Agency products assisted the response during last year's hurricane season, which affected Central America and the Caribbean. Other products mitigated fires in Mexico, floods in Panama, and earthquakes in Peru. Requests originated from both U.S. representatives in the impacted region and from NGA's foreign partners. In other cases, NGA's regional offices in the United States and abroad requested that the Office of International Affairs and Policy (OIP) inform disaster-stricken partners that NGA is prepared to assist them.

In August, NGA swiftly coordinated the release of commercial imagery and geospatial products with the Netherlands, the United Kingdom and France in an effort to assist a vast number of Caribbean countries affected by Hurricane Dean. Also, in August 2007 the agency quickly collected imagery to assist disaster responders after an earthquake measuring 8.0 on the Richter scale destroyed much of Ica, a town in southern Peru.

NGA provided Nicaragua with commercial imagery identifying entire towns that were isolated when bridges and roads collapsed from the force of Hurricane Felix in early September 2007. At the request of the U.S. Defense Attaché Office in the embassy in Managua, NGA also provided FalconLite™ software and training to the host nation's armed forces to enhance their capacity to respond to the situation.

In December 2007, NGA responded to a request for commercial imagery from the Dominican Republic following devastation from Hurricane Olga. This storm formed during the last week of the hurricane season, extending the requirement for NGA's support.

OIP closely coordinates with elements throughout the agency in response to commercial imagery requests from the U.S. Embassy in country as well as NGA's regional offices in Guatemala, which covers Central America and the Caribbean, and in Peru, which also covers Bolivia and Ecuador. Critical information coming from NGA's Integrated Watch gives the agency a first alert advantage in responding to natural disasters.

As ever, NGA remains committed to its support to its partners in their time of need. NGA's response to domestic natural disasters such as Hurricane Katrina demonstrated the range of assistance the combat support agency and member of the Intelligence Community can provide to those charged with reacting to disasters. The efforts to assist in similar situations outside the United States illustrates that NGA's concerns and ability to assist those in disaster situations are not bound by international borders. **P**

**EDUARDO ELINAN**

is a Staff Officer in the Office of International Affairs and Policy.



*Hurricane Felix devastated parts of Nicaragua in September 2007. NGA support assisted recovery efforts.*  
U.S. Navy photo by Mass Communication Specialist 2nd Class Zachary Borden



# Assistant Secretary of State Commends NGA for Annapolis Support

BY HEATHER COX

As if helping football stars, presidential candidates and firefighters weren't enough, NGA recently supported a historic meeting that brought longtime enemies Israel and Palestine to the peace table. The meeting, known as the Annapolis Conference, took place at the U.S. Naval Academy (USNA) during Nov. 23–24, 2007. It resulted in an agreement to start negotiations leading to the eventual establishment of a Palestinian state and the realization of Israeli-Palestinian peace.

NGA's involvement began just a month earlier, in the midst of assisting with the California wildfires operation, the Super Bowl, and preparing for the 2008 Republican and Democratic National Conventions. Ultimately, the hard work and overtime paid off.

Greg Starr, Assistant Secretary of State for the Department of State's Bureau of Diplomatic Security (DS), said, "The Annapolis Peace Conference was an unqualified success, and we owe a great deal of thanks to the many federal, state and local law enforcement and security agencies. Among those providing superb support was the NGA contingent, who provided us with up-to-the minute geographic photo and mapping

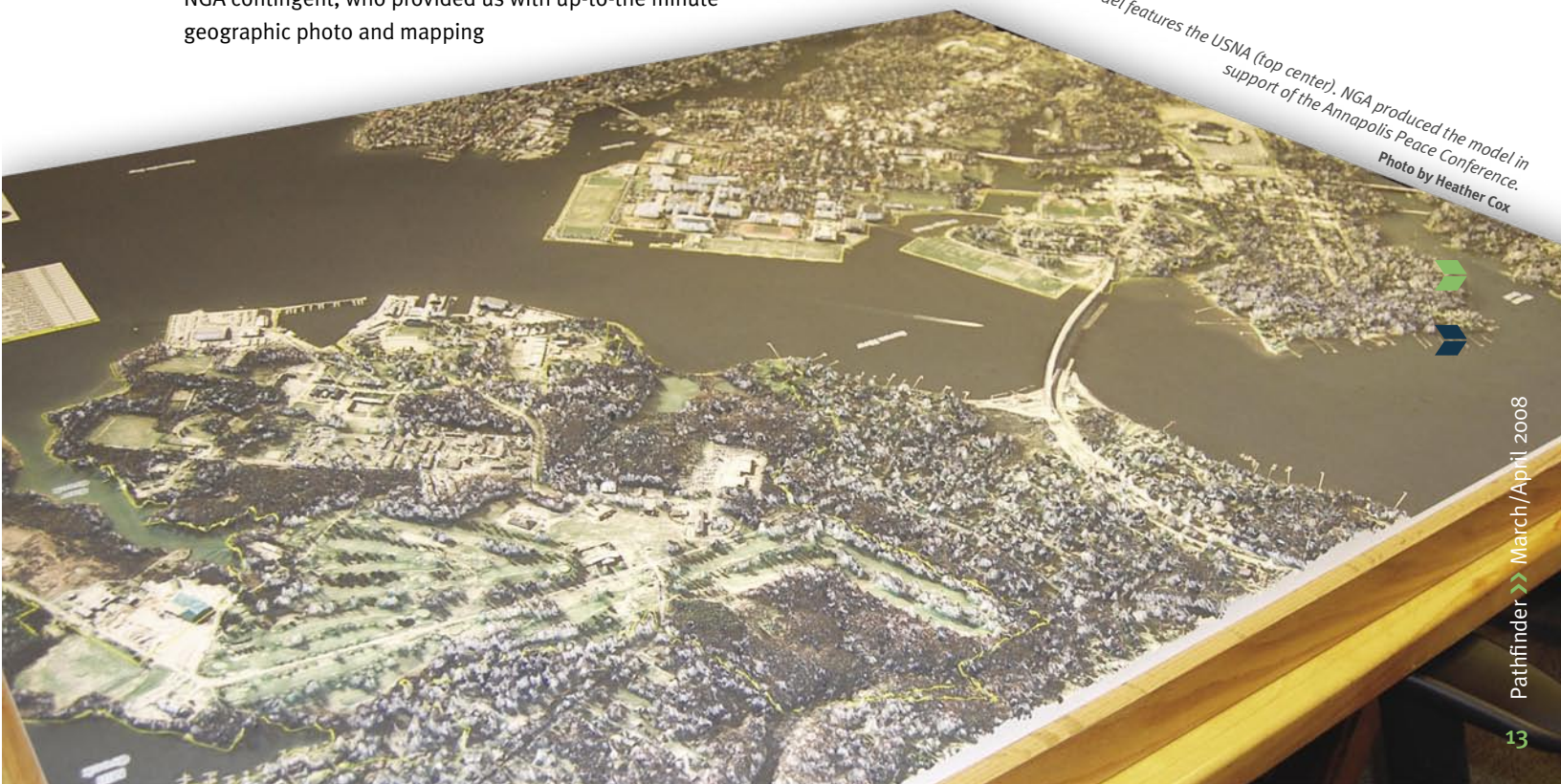
support linked to security site activities, which provided DS agents and other security and law enforcement with a new level of situational awareness."

## History

The request for NGA's involvement came in via the Department of State NGA Support Team (NST) on Oct. 25, 2007, from the Department of State's Major Event Coordination Unit (MECU). The order was tall: maps of Annapolis and surrounding roads, a 3-D model of the USNA, and a command center to monitor the activity.

In general, the Homeland Security Division (PMH) takes care of special events within continental United States. The regional Analysis and Production Directorate office and the Office of Counterterrorism usually support events outside the continental United States like the Olympics, Pan American Games, and the Cricket World Cup. The typical level of support for preparation for the event consists of providing

*A 3-D model features the USNA (top center). NGA produced the model in support of the Annapolis Peace Conference.  
Photo by Heather Cox*







the latest geospatial foundation data, identifying the local fire and law enforcement locations and emergency medical services, performing a counterterrorism analysis of critical infrastructure susceptible to a terrorist attack, and identifying any foreign or domestic threats that may target the event. PMH reached out to additional internal offices to obtain support, given the complexities of this event in addition to the current special event workload and the crisis support for the California wildfires.

According to PMH staff, this was a good example of an NGA federated approach for collaboration of a National Security Special Event. NGA offices provided support to the Bureau of Diplomatic Security, the lead federal agency for the event, and to various other agencies including the following:

- » the Department of State's Mobile Security Deployment Office for protection of Dr. Condoleezza Rice, Secretary of State, and visiting foreign dignitaries
- » the Department of Homeland Security for domestic threat analysis
- » the FBI
- » the Space and Naval Warfare Systems Command (SPAWAR) for communications support
- » the Defense Threat Reduction Agency for hazard plume model analysis
- » the Secret Service for protection of the president of the United States within the USNA
- » local law enforcement officials from Anne Arundel County, Prince George's County and the National Capital Region.

In addition, it was estimated that over 1,000 law enforcement officials supported the event.

NGA participated in the Annapolis Interagency Command Center (ICC). The ICC was organized by the Bureau of Diplomatic Security. There, NGA staff monitored the complicated network of activity surrounding the two days of events. NGA's on-site event team, the office of SPAWAR, the FBI NST, and Office of Global Support (OGS) technical representatives provided on-site geospatial intelligence (GEOINT) support, communication connectivity, and situational awareness capability to all agencies involved.

## Products and Services

NGA supported the conference in many ways. Various offices created pocket maps for drivers; Route 50 flip books; GEOINT event books, including depictions of points of interest with relevant analysis; hardcopy and softcopy GeoPDF® contingency and mission-planning graphics; and the latest 2007 Orthorectified Commercial Imagery Base for Annapolis. In addition, NGA provided geospatial foundation data to the ICC and helped to set up communication support for the deployment team.

NGA representatives reported that the security aspects of the event went well, and Department of State officials were very pleased with NGA's support in preparation for it. The 3-D Annapolis model, in particular, from the GEOINT Solutions Division, was used heavily. The MECU used it as both an orientation and training tool during its briefings to both federal and local law enforcement agencies. The model, milled from a block of polyurethane, generally would take between six and eight weeks to produce, but given the urgency of the international situation, the production staff created the model in 30 days. The model will continue to be used at the USNA for training and tabletop simulation purposes and is a permanent symbol of NGA's support of an international landmark in time. P

### HEATHER COX

is a Staff Officer in the Office of Corporate Communications.



# NGA Supplies Digital Aeronautical Data Access for Foreign Partners

BY APRIL CHOI-PAWLOWSKI AND SHARON STANISH

Timely and accurate aeronautical data is critical to safe and efficient global flight operations. Prior to Oct. 1, 2006, the Digital Aeronautical Flight Information File (DAFIF™), Flight Information Publications (FLIPs), and other aeronautical datasets were available to the public on NGA's World Wide Web site, [www.nga.mil](http://www.nga.mil).

On Oct. 1, 2006, NGA was required to remove this data from the Web to protect the copyrighted aeronautical information that originated from foreign partners and had been incorporated into NGA's aeronautical datasets. Not having access to these datasets would introduce significant risk for the U.S. Department of Defense, other federal and state agency users, general aviation, commercial airlines and vendors who profited from these datasets. In addition, NGA's foreign partners also rely on this data to support their various air platforms purchased from the United States, such as F-16s, F-18s and C-130s, for operations and safety of flight.

NGA's foreign partners provide invaluable aeronautical data through various types of agreements, typically informal Memorandums for Record (MFRs) recording verbal arrangements or annexes to formal, signed, legally binding Basic Exchange and Cooperation Agreements (BECAs). To allow continued and uninterrupted access to NGA aeronautical datasets, NGA's Office of General Counsel crafted a solution based on the principle contained in the 1947 Convention on Civil Aviation (the "Chicago Convention"), Annex 15, paragraph 3.4. Under this provision of the Chicago Convention, a party receiving copyrighted material may use or disseminate that material on the condition that all recipients are advised that the material is copyright protected and that the product is so annotated.

Under the above approach, as long as NGA indicates the datasets are copyrighted, this data can be shared with other countries for the safety of aviation. To implement this, NGA decided on a two-pronged process. Administrative protections were created by modifying existing or creating new agreements to add binding language protecting copyrights, while technical protections were created by establishing a secure Web site on the Web. Until a permanent technical solution was in place, NGA used a protected site on the Web as an interim stopgap effort for digital access.



*An F-16 takes wing. Foreign partners rely on aeronautical data to support various air platforms purchased from the United States.*

DoD photo by Capt. Tana R. H. Stevenson

The staff officers in the Office of International Affairs and Policy (OIP) and the Aeronautical Services representatives in the Office of Global Navigation led the effort to modify the BECAs and to convert the MFRs to more formal signed Memorandums of Understanding (MOUs), respectively. There are over 40 BECAs and 120 MOUs.

The new technical solution for making digital aeronautical datasets available for access by NGA's foreign partners will be dissemination on the Defense Security Cooperation Agency (DSCA) Security Cooperation Information Portal (SCIP). The SCIP enables foreign partners to access a variety of security assistance features gathered into "communities." NGA will be a new "community" on SCIP. Using SCIP to disseminate the aeronautical products is new for SCIP and is enthusiastically supported by Vice Adm. Jeffery A. Wieringa, U.S. Navy, Director, DSCA.

Digital aeronautical data, especially the DAFIF™, is critical to safety of flight for foreign partners as well as to the Department of Defense for mission planning. Partnering with DSCA to continue to make this data available to NGA's foreign partners saved the U. S. government significant resources by not having to develop a parallel system to serve a multinational customer set. Through this joint problem-solving approach, which involved entities inside and outside NGA, national security objectives continue to be met while saving taxpayer dollars. P

## APRIL CHOI-PAWLOWSKI AND SHARON STANISH

April Choi-Pawlowski is the NGA Foreign Military Sales Program Director working in the Office of International Affairs and Policy (OIP). Sharon Stanish is a Staff Officer with OIP's International Support Team. The Office of General Counsel and the Office of Global Navigation contributed to this article.





# NGA Forges Support for USAFRICOM

BY JUANITA HARTBARGER

On Feb. 6, 2007, President George W. Bush directed the establishment of the U.S. Africa Command (USAFRICOM or AFRICOM) and set as its goal to “...strengthen our security cooperation with Africa and help to create new opportunities to bolster the capabilities of our partners in Africa.”

NGA Director Vice Adm. Robert B. Murrett determined that NGA would become an important part of AFRICOM from its beginning with a team of analysts and experts inside the command’s footprint. An NGA Support Team (NST) would actively partner with AFRICOM. The timeline was short, so NGA moved quickly to rearrange resources and stand up its presence inside the command.

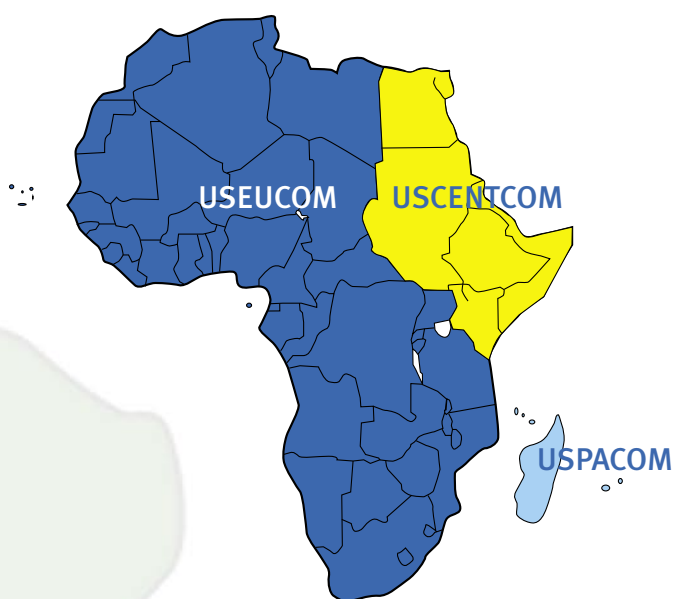
In December 2006, the president made the initial decision to launch the command. On May 23, 2007, three months after AFRICOM was established, NGA created an AFRICOM NST planning group to determine how best to support this new command and then translate its decisions into action. By September 2007, NGA had assigned one of its senior executives, Peter Lund, as NST Chief. In October 2007, AFRICOM reached initial operating capability.

## What is AFRICOM?

The creation of AFRICOM unifies Department of Defense responsibilities for 53 countries under one command—responsibilities that had been distributed among

## AFRICOM Area of Responsibility

### Prior to Establishment



### At Full Operational Capability



*Previously divided among three U.S. commands, responsibility for Africa was recently unified with the establishment of AFRICOM. Responsibility for Egypt is shared with CENTCOM.*

the European Command (EUCOM), the Central Command (CENTCOM) and the Pacific Command (PACOM). On the African continent, only Egypt does not fall entirely under AFRICOM; responsibility for Egypt is shared between AFRICOM and CENTCOM.

AFRICOM is currently a sub-unified command subordinate to EUCOM and is headquartered in Stuttgart, Germany. It is scheduled to become a unified command and reach full operating capability (FOC) by Sep. 30, 2008.

AFRICOM's draft mission statement defines its goal: to enhance "a mutually supporting stable, secure, and prosperous African environment through sustained U.S. government engagement with African, national, and international partners" and to conduct "military operations as directed."

### NGA's Mission and Achievements

Lund, with more than 25 years of experience in the Intelligence Community in both analysis and management, was the first senior official from a combat support agency to arrive in Stuttgart. At present, he and his deputy lead a small team, but that doesn't affect the long-term vision.

"The focus of the command," according to Lund, "will be on a non-kinetic mission set, including humanitarian assistance programs, disaster relief, resource development, construction projects and overall nation building. These mission sets are in addition to the more traditional ones such as peacekeeping and counterterrorism. GEOINT has much to offer in the execution of these missions, particularly in providing the sociocultural context where these missions will be conducted."

Lund's observation about the role of geospatial intelligence (GEOINT) at AFRICOM is more than just an exercise in rhetoric. In less than six months, the NST has accomplished a great deal. In addition to putting its leadership in place, the NST has:

- » Developed a GEOINT Concept of Operations for the Command
- » Developed a comprehensive transition plan for NGA personnel from the CENTCOM and EUCOM NSTs to staff analytic positions at AFRICOM

- » Continued the accelerated development of GEOINT information systems and infrastructure for the Command as initiated by the EUCOM NST—a collaboration between NGA's Enterprise Operations Directorate and a senior, on-site representative from NGA's Acquisition Directorate
- » Fully and seamlessly integrated itself into the command structure and daily activities, including participation in meetings with AFRICOM Commander Gen. William E. Ward and the senior staff

### The Way Ahead

Lund stresses the importance of ensuring that NGA's systems and architecture are successfully established and that analysts are in place to provide support to AFRICOM in Stuttgart when it reaches FOC, as well as to the headquarters staff when it moves to its future home on the African continent. In addition, according to Lund, "We need to educate the command on the value of GEOINT in supporting their mission set. One of the greatest challenges will be to continue to secure foundation geospatial data to enable us to generate tailored products."

Lund sees the AFRICOM NST as a unique opportunity for NGA to lend its voice, its expertise and its resources as a partner—"to participate in the shaping of a new command from the ground up." P

#### JUANITA HARTBARGER

is a Public Affairs Staff Officer in the Office of Corporate Communications, Internal Communications Branch. Peter Lund contributed to this article.







## PARTNERSHIPS

# NGA Welcomes New German Geospatial Liaison

BY HEIDI WHITESELL

NGA has a long-standing geospatial information-sharing relationship with Germany, the primary partners being the German Federal Ministry of Defense (FMOD) and the Bundeswehr Geoinformation Office (BGIO). Germany has been a reliable partner in the Global War on Terror and in other key areas of concern to the U.S. Department of Defense and several federal agencies. In particular, the NGA geospatial cooperation with the BGIO is one of its most valuable and fruitful partnerships; the recent establishment of a BGIO liaison officer to NGA promises to strengthen an already robust relationship.

The BGIO serves as the central institution for the Bundeswehr Geoinformation Service (BGIS). BGIS was established by merging the Bundeswehr Geographic Office, the German Military Geophysical Office, the German Geophysical School, and elements of the German Army Topographic Service, as well as elements of the German Air Force and Navy into a single organization. The BGIO is the sole provider of geospatial information to the German Military Forces. The organization maintains a worldwide geodatabase that it uses to produce a range of products, including Image City Maps (ICMs) (German version), Topographic Line Maps (TLMs), aeronautical products, digital data sets, and meteorological planning and forecast materials for the German Military and NATO. To accomplish its tasks, the BGIO works with many military agencies, civilian authorities, scientific institutions and international companies, as well as foreign partners.

NGA and BGIO's geospatial exchange and co-production arrangements are extensive and varied. The two organizations exchange topographic, aeronautic, and hydrographic data in hardcopy and digital formats. They also enjoy a co-production arrangement that satisfies both nations' military requirements and deployments. BGIO is a partner in the Multinational Geospatial Co-production Program (MGCP), which is designed to coordinate high-resolution vector data production. The topography co-production arrangement with the BGIO and its MGCP production commitments currently focus on the North African region. NGA also has aeronautical product and data exchange arrangements with the German Air Force Traffic Safety Office and with the civilian equivalent.



Photo courtesy of BGIO

Maj. Ole Fraehmke, NGA-BGIO liaison officer

Director of the BGIO, Brig. Gen. Walter Schmidt-Bleker, is also the Director of BGIS and as such is responsible for all geoinformation matters within the FMOD. Schmidt-Bleker has long been a strong supporter of the U.S.-German relationship. In June 2007, NGA Director Vice Adm.

Robert B. Murrett confirmed to Schmidt-Bleker NGA's support of the establishment of a German NGA-BGIO liaison position.

The NGA-BGIO liaison officer, Maj. Ole Fraehmke, will be located at and under the administrative control of the Commander, German Armed Forces Command (United States and Canada) in Reston, Va. Fraehmke has worked with NGA for a number of years on geospatial matters. It is anticipated that his areas of responsibility as the NGA-BGIO liaison will include the coordination of NGA-BGIO programs existing under the aegis of the U.S.-German Basic Exchange and Cooperation Agreement, as well as helping coordinate joint training programs for work processes of joint production at German and U.S. facilities.

Fraehmke arrived in Reston in fall 2007 and will formally begin in his new role in 2008. NGA looks forward to welcoming Schmidt-Bleker to NGA for the official ceremony in spring 2008 establishing the NGA-BGIO geospatial liaison position. P

HEIDI WHITESELL

is the Chief of the Germany Team in the Office of International Affairs and Policy.





WORKING FOR NGA

## Keeping an Eye on GPS Station Ecuador

BY JOHN TOMASOVICH AND RANDALL TAYLOR

**Vern Perdue has a small but important job with NGA.** He is the NGA point of contact (POC) for the Global Positioning System (GPS) satellite tracking station in Quito, Ecuador. The Quito site is one of 11 unmanned GPS stations located in such exotic locales as Buenos Aires, Argentina; Papeete, Tahiti; Pretoria, South Africa and Wellington, New Zealand.

NGA's GPS monitor station network supplies accurate geodetic measurements for the agency's geospatial intelligence (GEOINT) mission. NGA supplies real-time data from its GPS stations to the U.S. Air Force, which operates the GPS satellites and manages the daily task of calculating fresh GPS satellite orbital parameters. Over half the data used for GPS satellite accuracy comes from NGA. Telecommunications, weapons systems support, plate tectonics studies and navigation are among the diverse commercial, military, scientific and recreational applications of GPS technology worldwide.

The Quito GPS station is located in the Instituto Geográfico Militar (IGM), Ecuador's military mapping agency and one of NGA's longest international partners. The IGM facility, on a hill overlooking north Quito, is

an outstanding location for the station. It resides at an approximate elevation of 2850 meters above sea level and 20 kilometers south of the equatorial latitude that gives Ecuador its name.

Navigation satellite tracking operations in Ecuador began in 1967, when Special Mission Tracking Program (SMTP) Station 30121 was established north of Quito. Initially, one Inter-American Geodetic Survey (IAGS) technician and two IGM technicians operated the station 24



*Vern Perdue inspects the GPS station in Quito, Ecuador.*  
Photo by John Tomasovich





hours a day on rotating shifts. In the 1980s, SMTP evolved into GPS, and the station eventually evolved to unmanned operations. Although the NGA stations are managed remotely from NGA's network station control center in St. Louis, on-site POCs are needed to troubleshoot and provide hands-on assistance when needed to ensure smooth and accurate operations.

As POC, Perdue is on call 24/7 and visits the station weekly to visually inspect and clean the GPS instruments, check them for anomalies, and swap out equipment when necessary. He also acts as NGA liaison to the IGM and tracks the monthly expenses related to the station. Normally, the biggest problem at the site is dust. Perdue may also be called in to ensure GPS components are up and running correctly after an electrical outage.

In the event of more serious problems, a technical team from the NGA Office of GEOINT Sciences, GPS Division, notifies Perdue. By his account, the technicians are very patient, walking him through the tangle of wires, sockets and circuits to troubleshoot problems, sometimes by trial and error. Two years ago the weather/humidity sensor and sending unit needed to be replaced, requiring Perdue to stand on a small, elevated platform and reach up to unscrew the device. Later, a lightning bolt struck the IGM, and he was called on to replace the GPS antenna mounted on a tower above the elevator shaft on the IGM roof. Not bad for a guy who recently turned 82 years young.

Perdue's career has closely tracked the growth of the geodesy field as it developed into NGA's current operations. He began his career in 1951 at the geodetic training school in Panama as a triangulation observer on Escudo de Veraguas Island. Perdue soon moved to Colombia as part of a team running a geodetic level line between Cali and Cartagena, walking the entire round-trip distance of roughly 650 miles in a 10-month period. In 1953 Perdue was assigned to IAGS in Cuba, where he spent five years surveying and collecting tide data in Cuba, Jamaica and the Cayman Islands. This work was to establish basic horizontal and vertical control for U.S. Army Corps of Engineers mapping projects under way in the Americas. Perdue was later hired by the Aero Service Corporation in Amman, Jordan, serving as project manager for a U.S. government contract to map the Kingdom of Jordan. Here, Perdue participated in building the control network required for mapping the cities of Jerusalem and Bethlehem. In 1964, Perdue returned to South America to stay. As chief

of geodesy for IAGS Peru, he helped complete the first geodetic survey of the lowlands east of the Andes, in the Peruvian Amazon. In 1969, he moved to Quito as project engineer and was responsible for the full range of cooperative mapping, charting and geodetic programs in Ecuador. One highlight was the 1985 publication of the first bilingual topographic line maps produced under the U.S. Southern Command Topographic Augmentation Mapping Program. After 41 years in the field, Perdue declined an offer to move to the agency's site in Bethesda, Md., and retired from the Defense Mapping Agency in 1992. At that time, the Ecuadorean government honored him with the "Medal of Atahualpa," a presidential decoration awarded to foreigners for contributions benefiting the Republic of Ecuador.

For Perdue, working as POC is a labor of love, allowing him to visit his old stomping grounds at the IGM, remain in touch with friends at NGA and add to his lifelong legacy in geodesy. Originally from Eugene, Ore., Perdue and his high school sweetheart, Millie, married before moving to Panama and celebrated their 61st anniversary together last year. Amid their travels, they raised six children who were born across the western hemisphere in the United States, Colombia, Cuba and Peru.

Reflecting on GPS technology, Perdue marvels that what took IAGS engineers years to achieve can now be accomplished in months. "GPS was only a dream at that time," he says, but, "While it would have eliminated the difficulties, it would have eliminated all the adventure"—like the time Millie's flight from Quito was hijacked to Cuba, or evenings along the Jordan and Saudi Arabia border with a young Peter O'Toole and others on the set of "Lawrence of Arabia." Perdue has no intention of slowing down. "If there is no age limit, I'd like to stay as POC for the Quito GPS station, at least until a new technology replaces it." P

#### JOHN TOMASOVICH AND RANDALL TAYLOR

John Tomasovich is Chief of the NGA Regional Office in Lima, Peru. He is assigned to the NGA Support Team to the U.S. Southern Command and is responsible for NGA co-production programs in Peru, Ecuador and Bolivia. Randall Taylor is the Technical Team Lead for the GPS Monitor Station Network Control Center, where he leads the technical and logistical command and control for NGA's 11 globally dispersed tracking stations.



## OUR HERITAGE

# Commonwealth Friendships Stand the Test of Time

BY DR. GARY E. WEIR

**We must never allow our friendships to fade into the haze of daily routine.** We need to celebrate these associations and always remember their importance. The NGA Museum in St. Louis will do just that in June 2008 with a very special exhibit devoted to our productive association with the Commonwealth partners.

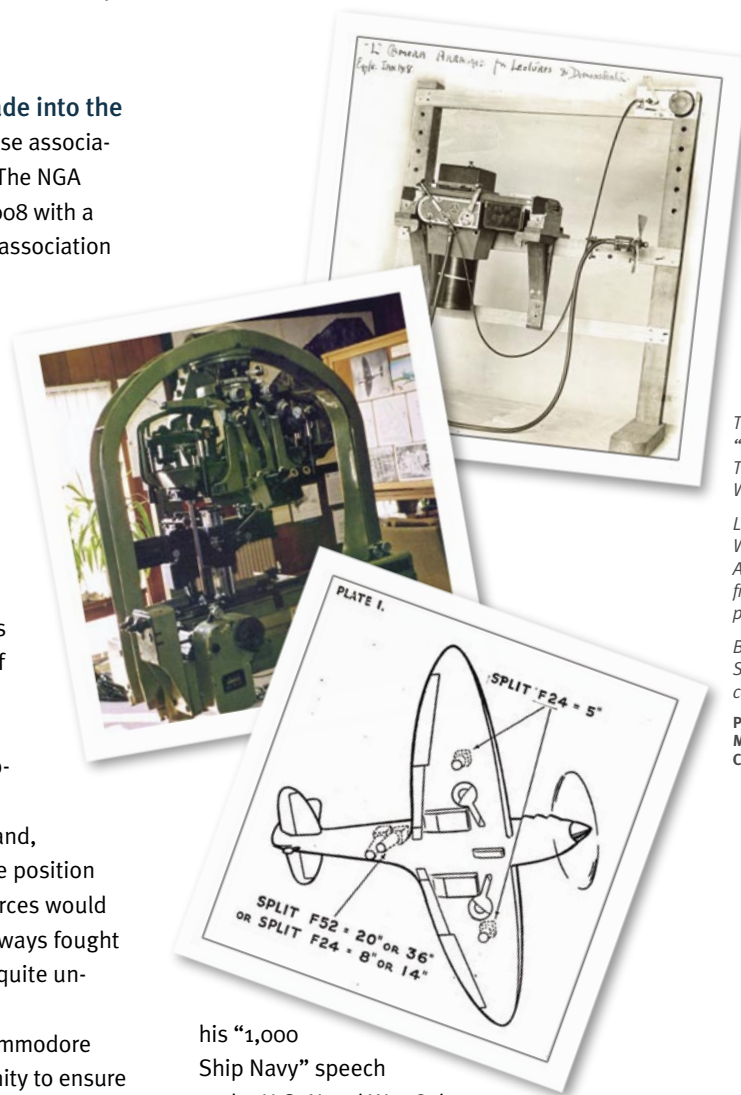
While true friendship often seems elusive, its effect is unmistakable. When I visited Australia for the first time in 2005, I had occasion to make a presentation on the historical significance of combined naval operations to an audience in Perth. At the reception afterward, while I was talking about World War II with a retired Australian Army officer, he departed from our theme to recall inviting American servicemembers to his home as part of a program to give them a brief respite from the war in Vietnam. The kindness of his family to our warfighters immediately reminded me of a colleague in Canada, a historian with whom I have worked for many years. Just after the war in Iraq began, he called me and, while fully understanding and appreciating the position of his government, lamented that Canadian forces would not join us. During the 20th century we had always fought together, and to do otherwise seemed to him quite unnatural. Can we find better friends anywhere?

Naval component commander Australian Commodore James Stapleton drew on the same kind of affinity to ensure the success of the United Nations coalition in East Timor in 1999. In my interview with him in 2004, he recalled, [I had people] from each country on my staff. And I was trying to replace the Australians with internationals....This became a problem for me then about classification, and what I could leave lying around and what I couldn't leave lying around. Issues like that. And what was privileged information, and what wasn't....It does make problems, but if you don't manage it, and I didn't have those guys and girls on my staff, for sure, then the coalition thing doesn't work.

Adm. Michael Mullen, chairman of the Joint Chiefs of Staff, electrified many of our allies around the world with

his "1,000 Ship Navy" speech at the U.S. Naval War College in 2005. In that presentation he addressed the need to keep the sea lanes of the world open against all manner of threats, including terrorists. He proposed combined fleet operations, taking advantage of the capabilities of allies who shared his vision of a free and peaceful ocean. Hosted by the Royal Navy in the United Kingdom the following year, the admiral found that our oldest, trusted Commonwealth friends became the first allies to step forward with support and commitment.

These experiences and people bring home to all of us the value of the friendship and close alliance we have with our Commonwealth colleagues. Since the Great War of 1914 -1918 the United States, Canada, Australia and Great



Top: British forces used "L" cameras to map Turkish territory during World War I.

Left: The British used the Wild Autograph Model A5 to derive 3-D imagery from pairs of aerial photographs.

Bottom: Sketch of a Spitfire shows four camera fitting locations.

Photos provided by the Medmenham Society Collection







Photo provided by the Medmenham Society Collection

*British analysts use a Wild Autograph Model A5 during World War II.*

Britain have relied upon one another to some degree in nearly every major conflict as well as the occasionally hot Cold War with the former Soviet Union.

At NGA we shall explore and celebrate well over a century of this very productive and satisfying partnership with an exhibit that will take up most of the first floor in the NGA Museum in St. Louis. For six months, the museum will play host to artifacts, stories, personalities and insights from the Canadian War Museum in Ottawa, the Medmenham Society in the United Kingdom, the Australian War Memorial, the Royal Australian Navy, NGA's own historical collections, and the Tasmanian Museum and Art Gallery in Hobart. American light tables and imagery analysis will live next to a portrait of Australian reconnaissance pioneer Sidney Cotton and the high-altitude optical advances of Tasmanian physicist Gavin Hills. Canadian cartographic achievements will offer insights into a tradecraft that helped establish the Distant Early Warning Line in the far north to alert the west to Cold War threats incoming over the North Pole. The British Medmenham collection traces imagery analysis back to the dark days of 1914 and the

efforts of the Royal Flying Corps to collect intelligence in Europe and the Near East. The Medmenham Society possesses one of the best imagery intelligence historical collections in the world, and some of that resource will appear in our exhibit.

We shall not only celebrate individual national achievements but also explore the frequent intersection of specialties, people and techniques. The exhibit will demonstrate combined efforts against Cold War adversaries, instruments in common, shared information collection techniques and collaborative analysis.

Should you be visiting NGA St. Louis between June and December 2008, come out to the museum and join us in exploring a welcome relationship of very long standing essential to NGA's mission. P

**DR. GARY E. WEIR**  
is the NGA Historian.



## IN CLOSING

# Pathfinder Editor Moves On

BY GAIL CHEROCHAK

As NGA's geospatial intelligence (GEOINT) magazine, the Pathfinder plays a starring role in promoting the public's understanding of GEOINT. Given the complex technical nature of GEOINT, this mission isn't always as easy as it might seem because the more technology has developed, the more difficult GEOINT has become to describe in plain English.

The job of making GEOINT understandable has fallen to dozens of communications professionals, but only one has lived through every generation of news publishing at the agency. From 1982 through 2007, editor and public affairs specialist Paul Hurlburt kept the Pathfinder and preceding agency flagship publications on course through reorganizations, staffing shifts and technology changes. But on Dec. 31, after 25 years of keeping the agency's news afloat, Hurlburt departed to write a new chapter in his own story: retirement.

As the lead Pathfinder editor, Hurlburt skillfully managed the magazine's production process, edited and wrote articles, and coached many authors through the techniques of news reporting. Known for his thoughtful advice and enthusiastic support, he had a knack for fitting the news into the context of the agency's GEOINT mission and history to tell the NGA story.

Just as GEOINT has developed with technology, so has the Pathfinder. Hurlburt's experience spanned an era of agency publishing that started with newspapers printed in black ink on white paper and ended with softcopy files of color pixels. And while technology improved the flexibility, speed and quality of publishing, it brought new challenges in software, file formats and image resolutions. Like GEOINT processes, the Pathfinder publishing continues to evolve.



The January/February 2008 Pathfinder was Hurlburt's last issue as editor. Like other retirees, Hurlburt is looking forward to reading the Pathfinder so he can keep up with the latest GEOINT news. Keeping in touch with his NGA teammates is on his long list of planned activities, as well as traveling. When he meets people who haven't heard of GEOINT, he'll know exactly what to tell them. P

### GAIL CHEROCHAK

is a contractor Communications Specialist working in the Office of Corporate Communications.







## 4th Annual Technology Days 2008

A unique opportunity for government, industry and academia to showcase the latest GEOINT capabilities and technologies!

### NGATech Day

Mission and industry partners are welcome to tour NGA office exhibits and discuss collaborative efforts. (Classified)

Wednesday, May 14  
NGA Headquarters  
Bethesda, Md.

### IndustryTech Day and Vendor Fair

USGIF members display the latest and greatest technologies. (Unclassified)

Thursday, May 15  
Sheraton Premiere at Tysons Corner  
Vienna, Va.

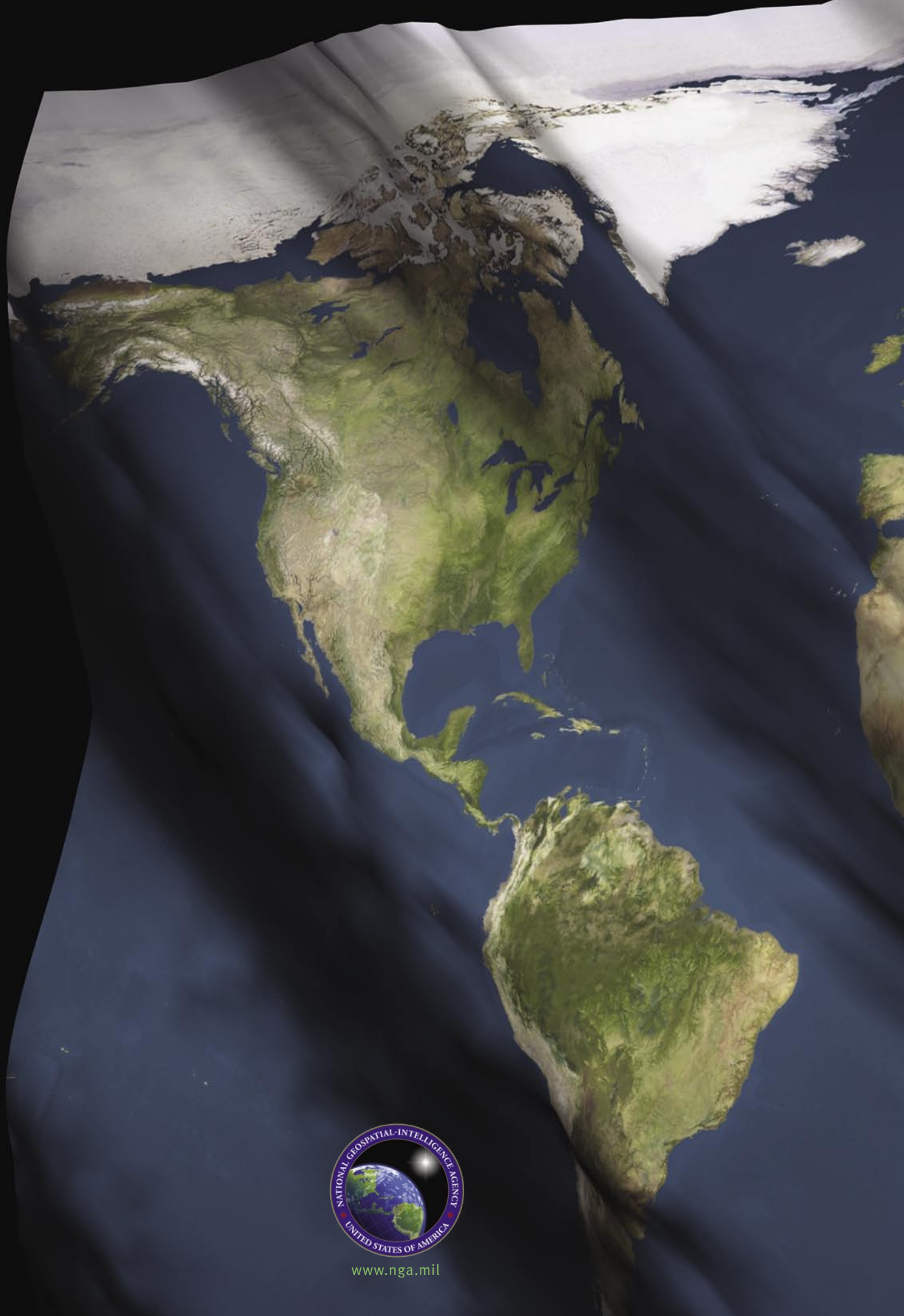
For more information, please visit  
[http://www.usgif.org/Events\\_TechDays.aspx](http://www.usgif.org/Events_TechDays.aspx)



Produced in cooperation with the United States Geospatial Intelligence Foundation (USGIF) and the National Geospatial-Intelligence Agency (NGA)







[www.nga.mil](http://www.nga.mil)