

NGA PATHFINDER

Magazine of the National Geospatial-Intelligence Agency

Vol. 2, No. 3 Fall 2013

Plotting the course

Marines at NGA follow in Washington's footsteps

'Xperience' NGA

Newly named directorate focuses
on customer service



User experience a driving force in NGA's transformation

CUSTOMER SERVICE. PHONE COMPANIES

tout theirs. Airlines praise theirs. Do it right, business booms. Neglect it, and business suffers. But how do we, as members of the Department of Defense and Intelligence Community, define "good" customer service? I believe it involves understanding customer needs and conducting business so we meet those needs as expeditiously, efficiently and responsibly as possible. It involves giving our customers the ability to solve their problems and gain valuable insight. It involves ensuring our nation's leaders can see what our adversaries cannot, know what our adversaries wish to remain unknown, and act before our adversaries have the chance.

Everything, everyone and every activity on Earth has a time and a place. That unique spatial-temporal geo-reference can have volumes of information tagged to it. As such, NGA is poised to take intelligence activities beyond where we ever imagined. Change and evolution – revolution – are in our DNA. We are the pointy tip of the spear. Gone are the days of static maps and imagery products. We are a dynamic provider of advanced GEOINT content, analysis and services.

Our customers are in for a great experience when they come to us. We have listened to them. We have experts and analysts from many disciplines immersed in data and focused on the same hard problems. Customers will find the data they need, when they need it and in the format they need it. We have a deeper and wiser connection with our customers than ever before – we anticipate their needs and create valuable integrated experiences that rival the impact of smartphones and tablets.

Customer service led me to change the name of the office of Online GEOINT Services



to the Xperience Directorate, with the designator of X, and dedicate resources to ensure no customer ever walks away from an NGA interaction with a negative experience. In this issue of Pathfinder, the newly appointed lead of X, Geoff Fowler, gives his take on customer service and the way forward for our interactions with our partners and other users of our GEOINT.

This issue also highlights one of the many GEOINT-based courses we provide the DOD here at the NGA College. The Marine Corps Basic Surveying Course trains the men and women the Corps needs to provide accurate and timely mapping and surveying in support of national objectives. I am proud of the work we do here at the college for the military services, and I am committed to ensuring we continue to meet their needs.

Also, be sure to take a look at our new feature called GEOINTeresting that is a compendium of fun facts and trivia illustrating GEOINT's use around the world for work and play.

Enjoy this issue of **PATHFINDER!**

Letitia A Long

Letitia A. Long
Director

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in users' hands**

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*Cover photo of National
Geospatial-Intelligence
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Clark, Office of Corporate
Communications*



NGA Salute.

By Kris Mackey, Office of Corporate Communications

PETTY OFFICER 3RD CLASS LAURA HICKMAN

PETTY OFFICER 3RD CLASS LAURA HICKMAN is a Navy intelligence specialist and a rising leader in the Navy who has done some of her primary growing and shaping at the National Geospatial-Intelligence Agency's East campus in

Springfield, Va., according to her leaders at NGA.

Since coming to NGA, she has been named junior enlisted of the quarter, and her experience at the agency inspires her to continue to be a leader in the intelligence community and military, she said.

Hickman joined the Navy in 2010 and came to NGA shortly afterward. She works in the Targeting Support and Analysis Branch, part of the Precision Targeting Engagement division. She and others on the AIRTO team provide precise GEOINT and multi-source imagery analysis for NGA's defense and intelligence community customers.

"Simply put, I make sure we hit where we aim," said Hickman.

"She is an integral part of our office," said Hickman's supervisor, Matthew Murdock. "Her dedication to the targeting mission is unquestioned."

Her exposure to advanced technology and education at NGA's college, training

opportunities, and the coordination that goes with multisource intelligence at NGA has given her a uniquely rounded experience that will be valuable when she departs for her next assignment, she said.

"NGA is fortunate to have devoted and enthusiastic young sailors (like) Hickman working for the agency and furthering the NGA mission," said Murdock. "They'll take their GEOINT training into the field, and that's critical to the self-service model we seek in the long run."

Leadership is a strong focus at NGA and has had its effect on IS3 Hickman, she said.

"I have mentors all around me," said Hickman. "When I see something I like in a person or someone who is really good at a particular skill, I ask to learn from them, and so far no one has turned me away. To me, stagnation is unacceptable, and at NGA there is no such thing." ✨

Photo by Tony Boone, Office of Corporate Communications



REMEMBER NGA HOLDS MOMENT OF SILENCE FOR 9/11 VICTIMS.



NGA Deputy Director Michael Rodrigue presides over a 9/11 commemoration and moment of silence at the agency's Springfield, Va., headquarters.

Photo by Kevin Clark, Office of Corporate Communications



NGA participates in joint exercise, proves sky no limit to collaboration

By Jacquelyn Karpovich, Office of Corporate Communications
 Photo courtesy of Civil Air Patrol.

A RECENT EXERCISE SHOWCASED THE CRISIS SUPPORT capabilities of three federal agencies by simulating response efforts to flooding and tornado damage in the Midwest region.

The joint training exercise between the Federal Emergency Management Agency, the Missouri wing of the Civil Air Patrol, or CAP, and the National Geospatial-Intelligence Agency was held Aug. 16-18 in Marshall, Mo.

“It was an invaluable opportunity to see the skillsets of each of the participating agencies.”

- Rich Manning

in the exercise. “It was an invaluable opportunity to see the skillsets of each of the participating agencies.”

IWG-R3’s mission focuses on enabling online, on-demand support to domestic and international emergency preparedness, response and recovery mission partners. Throughout the exercise, NGA responded to 14 requests for information, creating large format graphics for FEMA for accurate flooding and damage assessments, and used full-motion video to generate 360-degree products.

NGA used imagery collected by CAP, a national volunteer organization tasked by the Air Force’s Rescue

“When you get that many agencies together, you get a lot of interactions and build rapport,” said Rich Manning, part of NGA’s Integrated Work Group – Readiness, Response and Recovery, or IWG-R3, team, that participated

Coordination Center, for initial damage assessments and identification of areas most impacted by the crisis, said Manning. NGA then provided FEMA with products through a Web-based production and management tool, which was also accessible via iPads.

“CAP’s role in search and rescue missions and disaster response coupled with the IWG-R3 support to FEMA as lead federal agency highlighted the importance of that critical 12- to 24-hour post-event window,” said Manning. “That window is where NGA’s damage assessments play a crucial role in allocating resources and giving decision makers the right tools to move forward with recovery efforts.”

Another success story from the exercise was the integration of NGA products with CAP’s Airborne Real-time Cueing Hyperspectral Enhanced Reconnaissance, or ARCHER, system, said Manning.

“We were able to incorporate the data being collected from ARCHER and seamlessly integrate it into our Google Earth and ArcGIS products,” said Manning. “It was a real win for NGA in the eyes of our CAP and FEMA partners.”

“I do believe CAP, NGA and FEMA are more aware of each agency’s capabilities in collection and exploitation than ever before,” said Cory MacVie, regional GIS coordinator for FEMA. “Throughout the exercise, CAP collected over 2,000 ground and aerial images and ... we were successful in utilizing NGA for exploitation, creating mock rapid damage assessment(s).” ✨



'XPERIENCE' NGA

NEWLY NAMED DIRECTORATE FOCUSES ON CUSTOMER SERVICE

By Karen Finn, Xperience Directorate
Photos by Kevin Clark, Office of Corporate Communications

NGA OFFICIALLY LAUNCHED THE XPERIENCE DIRECTORATE Oct. 1, changing its name from Online GEOINT Services to better reflect its mission in the agency and cover the range of activities that the directorate is responsible for stewarding, namely a focused effort on the customer's experience and customer service.

"In a business sense, you might say the X Directorate is the customer service, delivery, marketing and the availability aspect of the business," said Geoff Fowler, director of Xperience Directorate. "It is important to get those elements right if you are going to be successful."

Part of delivering excellent customer service is making it easy for customers to find, access and understand content and services, said Fowler, a 26-year intelligence officer, who recently served as the founder and managing editor of Central Intelligence Agency's World Intelligence Review, or WIRE.

"While it may be individually rational to establish sites targeted to particular customers, it is actually irrational when serving all of NGA's customers," said Fowler.

Maintaining multiple websites often results in redundant and often outdated content, is enormously expensive and makes it difficult for the agency to collectively measure customer behavior to make possible improvements, said Fowler. He compared the efforts to consolidate websites to

cutting a diamond – an agency that cuts the right facets for its customers increases its value.

"A diamond's value is enhanced when it is expertly cut – when facets are skillfully added that allows the light to reflect and sparkle," said Fowler. "In our Web presence, the facets are the interfaces designed to meet the needs of customer archetypes. This is one of the reasons it is so important to understand our customers and to do a customer segmentation study – so that we know how best to create a tailored facet for each customer."

Business intelligence will help ensure NGA makes insightful decisions, said Fowler.

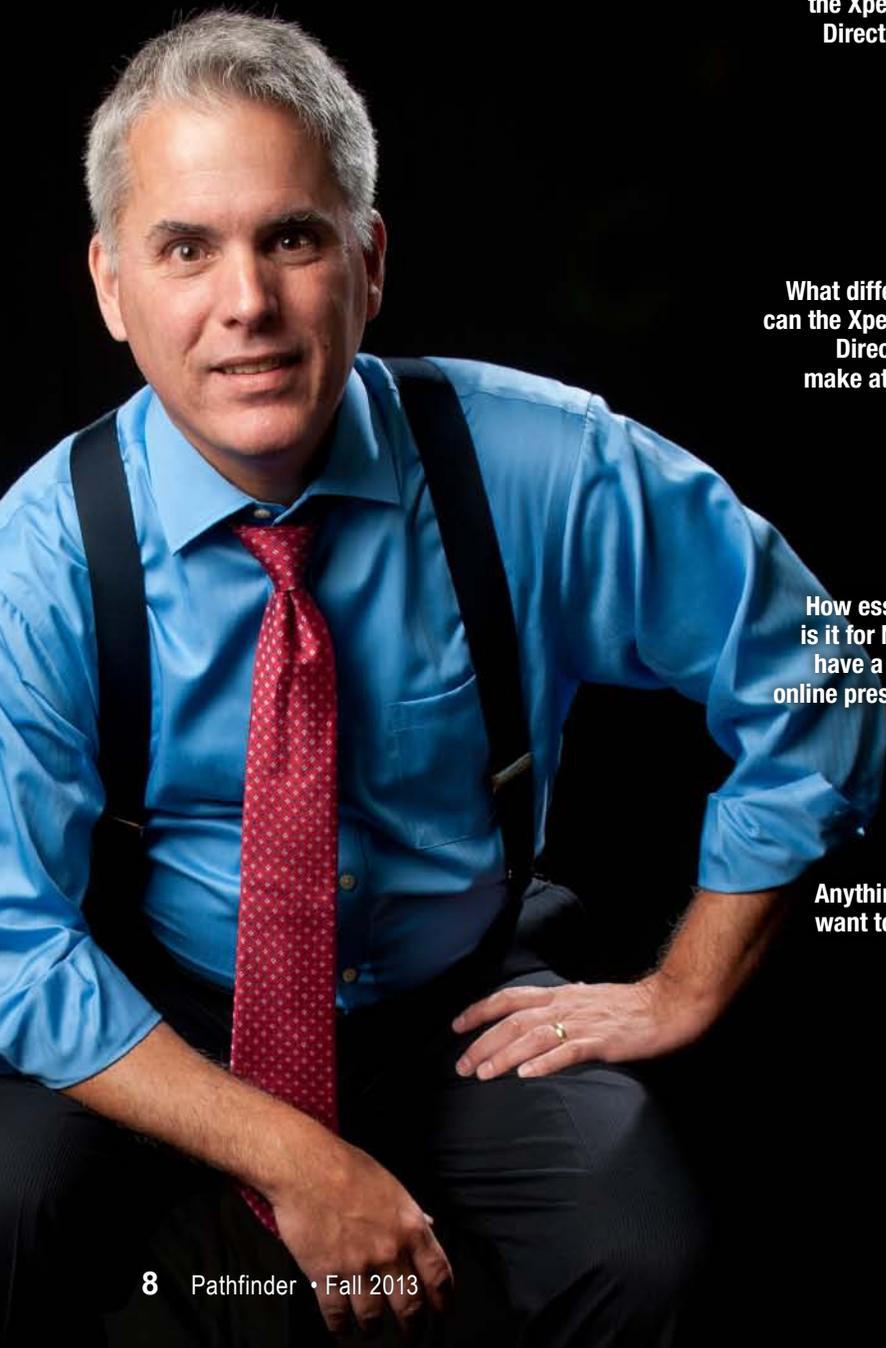
The X Directorate is responsible for establishing the agency's business analytics to help leaders make decisions based on relevant data. It is essential to know how we serve our customers and how customers use or access our core content and services, said Fowler. That knowledge allows the agency to make astute, data-driven decisions about how to better meet the needs of those customers and improve our processes at the same time.

"We must take our knowledge – and that of our partners, inside and outside the government – and present it in ways that best serve the needs of customers," said Fowler. "By putting customers first in all we do, we create and maintain an important value proposition for the enterprise and help deliver on our mission – informing thinking and decision making centered on the nation's security."*

INTERVIEW WITH GEOFF FOWLER, DIRECTOR OF NGA'S XPERIENCE DIRECTORATE

"GEOINT is foundational to the intelligence integration objectives of the community."

- Geoff Fowler



Being new to NGA, what is the most significant quality you bring to the agency and why?

GF: I am honored to join NGA and work to create its consolidated online presence. I'm amazed at the quality and presence of NGA's footprint and its myriad contributions to national security. In many ways this is our strength. But, it can also be our Achilles heel in that it makes it challenging to succinctly articulate who we are and what we stand for. I have proven experience in building a strong brand and expertise in bringing a team together to focus on the technology and processes to support core business areas. As a new member of the NGA team, I can make recommendations with a fresh eye.

Why did the Online GEOINT Services Directorate become the Xperience Directorate?

GF: In short, clarity and focus. These are critical when driving to an objective as important as making NGA a customer-focused enterprise. Also, the name Online GEOINT Services did not tell you the directorate was customer focused. Our name needed to capture the focus of the organization, better reflect the agency mission, and perhaps most importantly, establish a unifying brand that was exciting, motivating and future focused. We chose Xperience as the best descriptor of what the directorate was responsible for and how it fit into the NGA structure.

What difference can the Xperience Directorate make at NGA?

GF: An enormous difference. I think of our enterprise as a business that operates in the information services industry – specifically, but not solely, geospatial information services. GEOINT is foundational to the intelligence integration objectives of the community. Any business with solid end-to-end excellence is headed for success, and strong customer service, distribution, marketing and sales help gain and retain customers.

How essential is it for NGA to have a single online presence?

GF: If we don't do it, we will fail to serve our customers. I know some will say we serve our customers best when we deliver tailored websites for their needs. Yes, we serve customers well when we provide tailored services. But no, we don't serve them well when we have a proliferation of online sites that forces customers to go from one to another to find what they need. That actually makes it harder on our customers, not easier.

Anything you want to add?

GF: I am delighted to be at NGA. I've served 26 years in the intelligence community in a variety of capacities, from line analysis to staff assignments. I've worked with Congress as a senior representative to Homeland Security and the White House. For the last seven-and-a-half years, I served as the founding director and managing editor of CIA's World Intelligence Review, or WIRe. I have a loving family that keeps me young. I've been embraced by colleagues at NGA and I'm learning about this critical component of the IC – essentially enlarging my family. I'm blessed. ✨



NGA helps

Stop elephant POACHING

African elephant range, population and threats

* Poaching threat index is based on four factors identified in the CITES Monitoring the Illegal Killing of Elephants (MIKE) 2012 document CoP16 DOC.46.1. that correlate with illegal killing of elephants including governance, law enforcement capacity, infant mortality and farming.

Data Source: 2012 Ibrahim Index of African Governance report.

Note: Data was unavailable for South Sudan.

**CITES PIKE is an index that measures the annual proportion of illegally killed elephants to the total number of carcasses found at each site (values in black italics). The index ranges from 0.0 (no poaching) to 1.0 (all carcasses encountered are due to poaching). The PIKE index is calculated for specific "Monitoring the Illegal Killing of Elephants" (MIKE) sites.

Source: CITES, Monitoring the Illegal Killing of Elephants, 2012. (COP 16 Doc. 53.1)

By Jacquelyn Karpovich, Office of Corporate Communications

THE NATIONAL GEOSPATIAL-

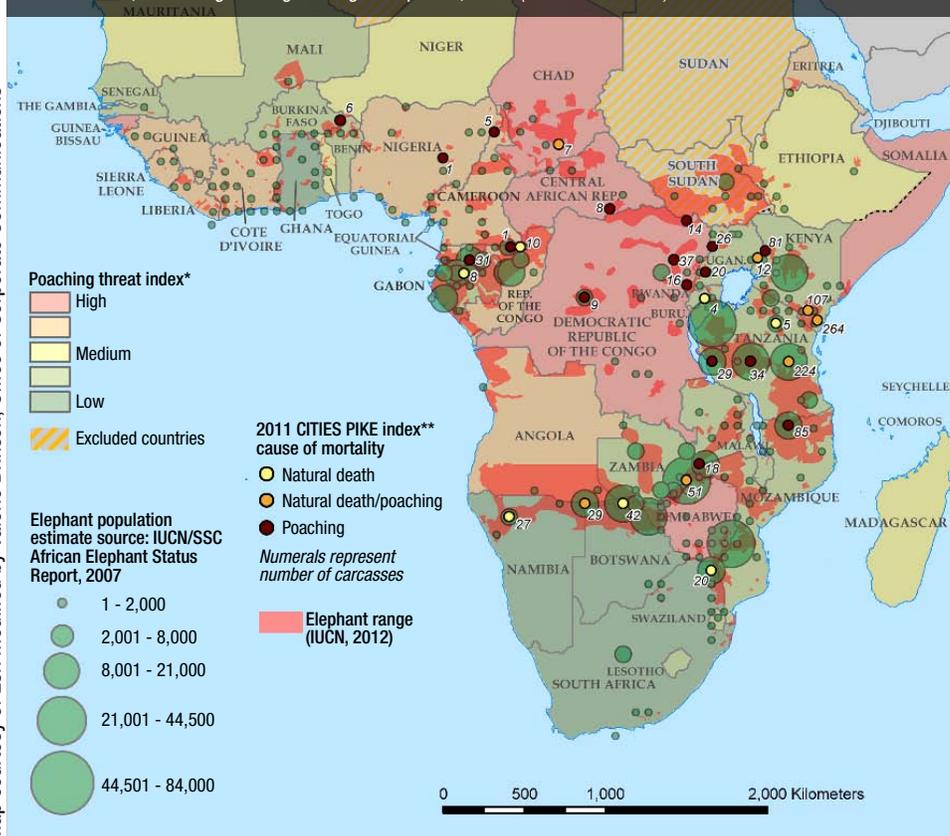
Intelligence Agency recently partnered with the Department of State to produce the "African Elephant Poaching Threat Map," showing the location of Africa's elephants and where they are most likely to be poached.

The NGA Support Team at DOS worked with the department's Bureau of Intelligence and Research and experts in African wildlife trafficking to create a map layer, called the poaching-threat index, which depicts key factors driving poaching, said Bob Bouvier, a geospatial analyst with the support team.

"The issue of wildlife poaching and trafficking has become a foreign policy priority," said Bouvier. "Having briefed this map to various assistant secretaries across federal government, as well as key non-governmental organization partners, the team hopes this map might be used to inform policymakers and spur resource investment to affect change."

During President Barack Obama's July trip to Africa, this map was briefed to senior officials and included in the president's briefing book. The president established a cabinet-level task force to address wildlife trafficking and released an executive order on the topic, noting that the survival of protected wildlife species, such as elephants, has beneficial economic, social and environmental impacts on all nations. ✨

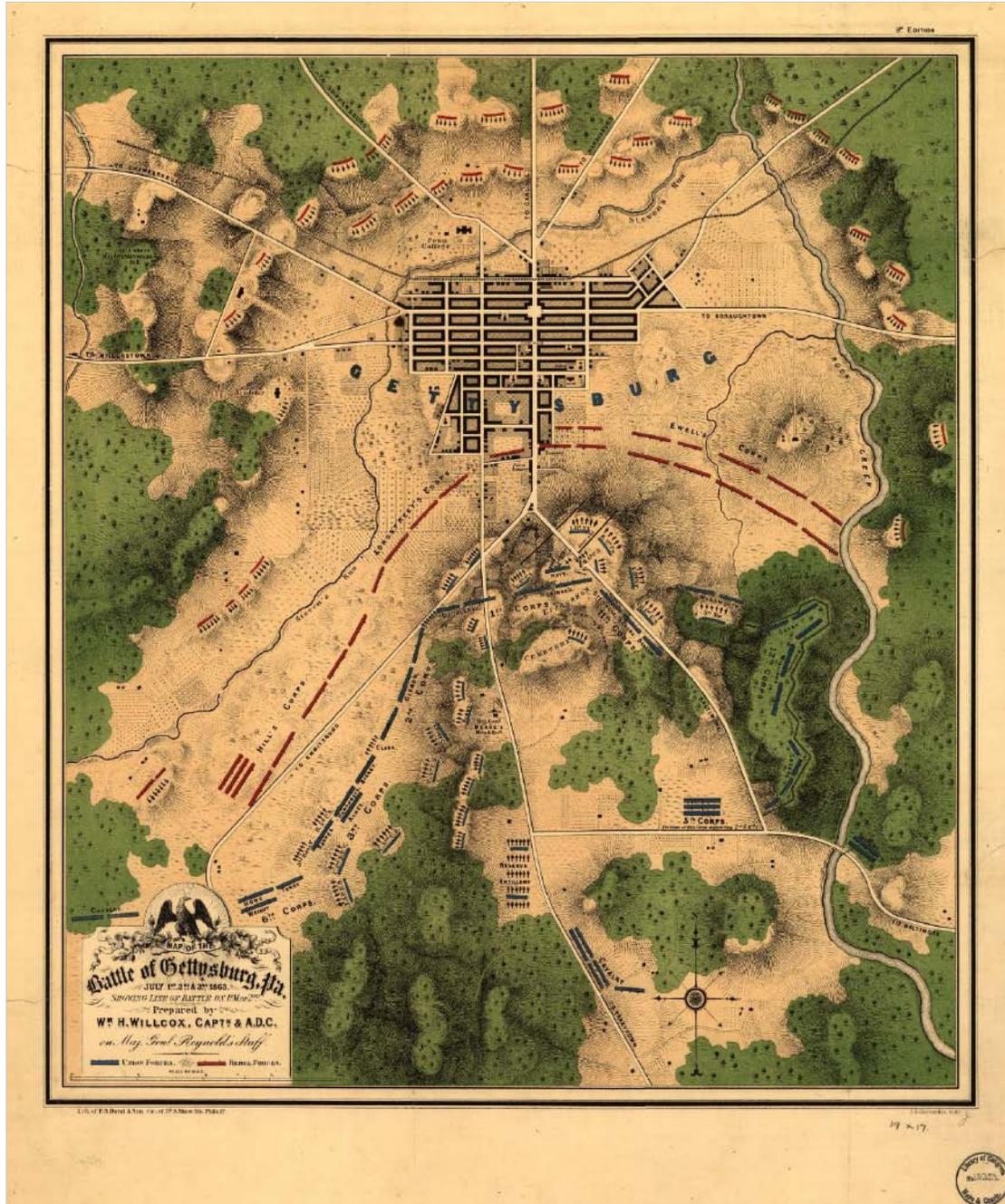
Map courtesy of Esri modified by Valorie Brinson, Office of Corporate Communications



Went to Central Pk Zoo to meet w/wildlife experts about elephants. Their solution: Stop the Killing - Stop the Trafficking - Stop the Demand

NGA employees live history during

BATTLE of Gettysburg's 150th anniversary



An 1863 Union map of the Gettysburg area. Courtesy of Library of Congress.

By Jacquelyn Karpovich, Office of Corporate Communications

AN IMAGERY ANALYST AND A HUMAN GEOGRAPHER HAVE A LOT IN COMMON BESIDES THEIR JOBS at the National Geospatial-Intelligence Agency in Springfield, Va.

They both donned wool uniforms and spent three days in the suffocating summer heat during a re-enactment of the Battle of Gettysburg, Pa., July 1-3 as part of the activities surrounding the battle's 150th anniversary.

Shepard Cook, an imagery analyst in the Office of Special Programs, and Patrick Ellis, a human geographer in the Source Directorate, participated in a week's worth of living history activities with their respective re-enactment groups to commemorate the battle.

Cook's passion for re-enactment was passed down from earlier generations, creating a minor Hollywood star in the process, he said. Cook was an extra in the Civil War films "Gettysburg" and "Gods and Generals."

“My great-grandfather fought at Gettysburg,” said Cook. “I have his sword, his uniform buttons and a variety of other things. I went to the 100th anniversary of Gettysburg as a 9-year-old.”

During the July re-enactment, Cook lived for three days “in the field” only yards from where his great-grandfather, U.S. Army Capt. John Darwin Shepard Cook, fought during the original battle with the 20th New York State Militia.

Ellis’ interest started when he was a child and his assistant Boy Scout master’s son told him about a re-enactment he had attended, said Ellis.

“We were sitting around the campfire during one campout and they were sharing stories from a recent re-enactment, and I said, ‘Hey! That sounds like a lot of fun.’”

Since the first sounds of gunfire during the 139th anniversary re-enactment of the battle, Ellis has been hooked, he said. Since then, he has portrayed a private, corporal, second sergeant and first sergeant of his company, Company A, 7th Maryland Volunteer Infantry. He recently returned to the rank of private.

“It’s a lot more fun,” he said.

Beyond the strong ties to ancestral and American history, re-enacting provides a way to experience GEOINT in its earliest form, he said.

“Each day, members of the public were in the camp asking not just the ‘Is-that-uniform-hot?’ questions, but other questions about logistics, mapping, telegraphs, technology,” said Cook. “All of the intelligence reporting that we do today is actually rooted in the American Civil War.”

Two examples of early GEOINT in action during that period are embodied in the experience of Thaddeus S.C. Lowe and Jedediah Hotchkiss. Lowe served as chief aeronaut of the Union Army Balloon Corps, a civilian contract organization, whose efforts marked the start of the U.S. military’s era of aerial reconnaissance.

Hotchkiss was one of the most famous cartographers and topographers of the Civil War, serving directly under Confederate Gen. Stonewall Jackson. He was a prized resource at a time when soldiers on both sides would strip maps off the walls of civilian homes.

Maps, or the lack thereof, informed much of the war’s tactical experience, said Cook. “The biggest gap every single commander had on both sides was accurate maps,” said Cook. “It was one of the reasons the U.S. stood up mapmaking at the beginning of the 20th century. The whole geographic intelligence our Army relies on today was a requirement known during the Civil War, but not met.”

Looking at the war through the lens of his human geography work at the agency, Ellis said having a better knowledge of the communities, whose citizens found war on their doorsteps, would have been greatly beneficial for Civil War commanders.

“When Lee invaded Maryland during the Antietam campaign, he really expected a lot more Southern sympathizers,” said Ellis. “Had he done his human geography analysis ahead of time, he would have known that western Maryland (citizens were) a lot like the Pennsylvania Dutch – Union loyalists.”

While re-enactment has proved an effective way to understand history and the foundation of GEOINT, it’s also enjoyable, said Cook.

“I think one of the reasons we all fall into the hobby of re-enacting is that it is a lot of fun,” said Cook. “I don’t mean running around in the uniform shooting blanks. I mean sitting around the campfire, chewing the historical fat with a group of people who are as interested in it as you are.” ✨

“The biggest gap every single commander had on both sides was accurate maps.”

- Shepard Cook



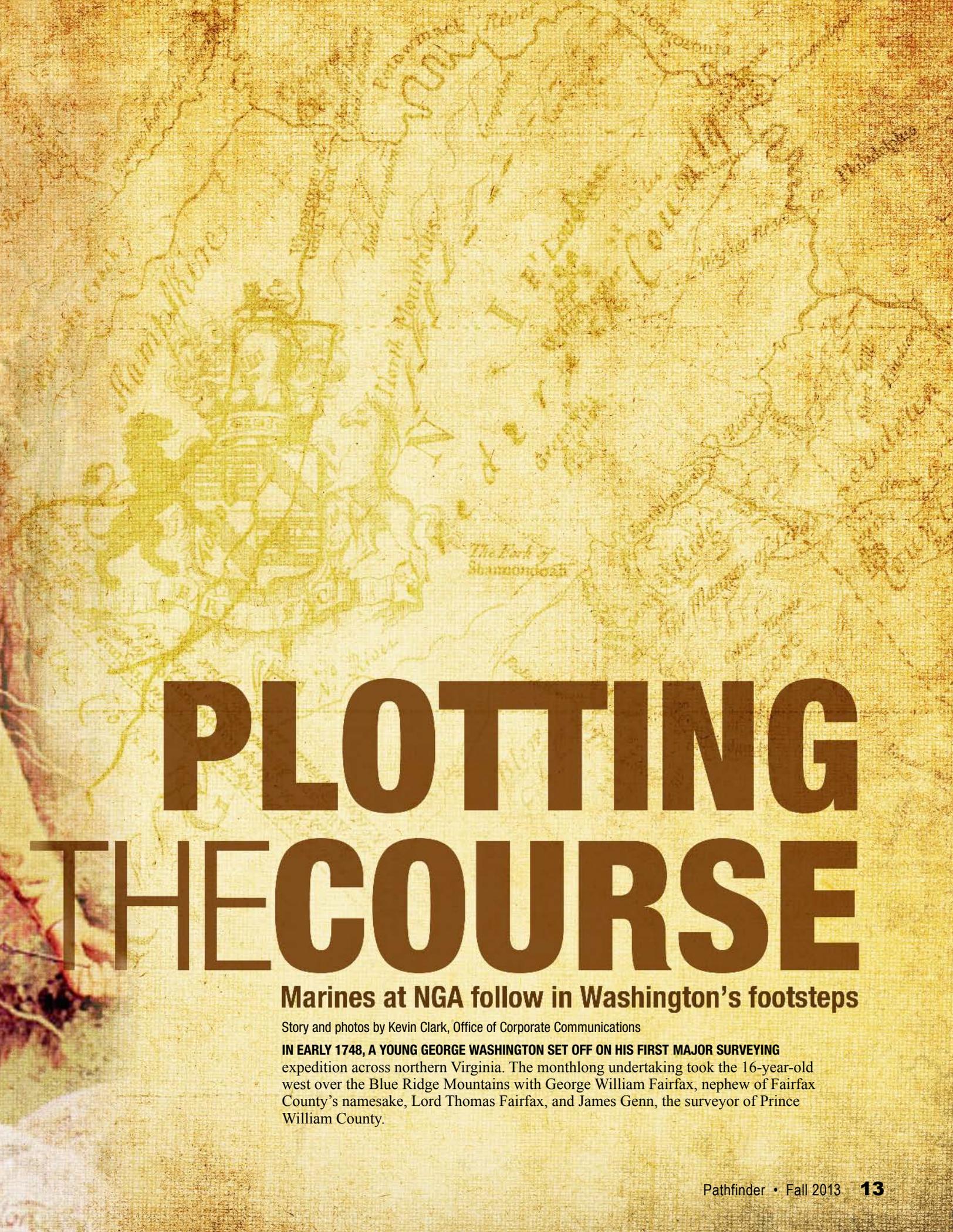
Cook stands near where his grandfather fought during the Gettysburg battle. Photo courtesy of Shepard Cook, modified by Valorie Brinson, Office of Corporate Communications.



Collection of the Ewing Gallery, University of Tennessee, Knoxville
Gift of the Washington National Insurance Company, Evanston, Ill.

WWW.EWING-GALLERY.UTK.EDU





PLOT THE COURSE

Marines at NGA follow in Washington's footsteps

Story and photos by Kevin Clark, Office of Corporate Communications

IN EARLY 1748, A YOUNG GEORGE WASHINGTON SET OFF ON HIS FIRST MAJOR SURVEYING expedition across northern Virginia. The monthlong undertaking took the 16-year-old west over the Blue Ridge Mountains with George William Fairfax, nephew of Fairfax County's namesake, Lord Thomas Fairfax, and James Genn, the surveyor of Prince William County.

A scale of Miles 69 1/2 in one Degree of Latitude

conduct topographic and hydrographic survey operations, analyzing terrain and hydrography as a functional aspect of military intelligence.

The first area of course study is a three-month, survey-based phase that develops the skills necessary to perform geographical surveys in the field, said Marine Staff Sgt. Keith Winfrey, a course instructor at NGA.

At the end of the first phase, students test their new skills in a weeklong exercise that demonstrates their newly developed talents as Marine Corps surveyors, said Winfrey. The next phase of their training integrates their work into useful products for developing military intelligence.

Find out more about the course at www.marines.mil. Find out more about NGA at www.nga.mil. ✨



WWW.MARINES.MIL

U.S. Marine Pfc. Nathan A. Edwards operates a Topcon Total Station during his survey phase exercise July 26. The Total Station gives point-to-point measurements from location to location, allowing its user to later upload the data and detect any change in a point's initially presumed coordinate. One use for such data is to help pinpoint artillery targets in the field.

U.S. Marine Sgt. Austin R. Hackett collects data points using a GPS-based Field Controller 200 as part of a "real-time kinematic survey" during his survey phase exercise July 26. The points collected with the FC 200 will be recorded as specific objects during the exercise and later uploaded to mapping software such as Google Earth to show the locations of fence lines, manhole covers, trees and any other obstructions.





U.S. Navy Senior Chief Petty Officer Charles Mason briefs Rear Adm. Thomas L. Brown II on an imagery delivery system during Exercise Enterprise Challenge July 23. Brown is the director of NGA's Military Support Directorate. NGA Photo.

NGA-led exercise tests technology, international partnerships

By Jason Moll, Office of Corporate Communications

NGA EMPLOYEES IN JULY LED A

transcontinental and transatlantic exercise in California that allowed U.S. and “Five Eyes” partners to test the ability of equipment to transmit, discover and store intelligence, surveillance and reconnaissance data over a network.

The annual exercise, known as Enterprise Challenge, was held in the western Mojave Desert at Naval Air Weapons Station China Lake.

Enterprise Challenge-13 provided a chance to field test integration and interoperability of the equipment and network before deploying to theater, said Ronnie Stanfill, NGA contractor and exercise director.

“If you’re going to fight in Afghanistan, and you have a radio and (an) air platform impacted by heat, you’re better off discovering that in the desert of California than in theater, where it may fail,” said Stanfill.

The U.S. undersecretary of defense for intelligence, or USDI, asked NGA to lead the exercise because of the agency’s experience bringing together the military services, intelligence community and international partners,

and for its familiarity with research and development in innovation, testing and evaluation, said U.S. Navy Cmdr. William Pharis, NGA program lead for EC-13.

While the overall goal of the exercise was to ensure network interoperability and compatibility, each service branch and international partner had its own objectives, said Pharis.

“The Army was interested in knowing how well the antenna on its mobile, tactical ground station was working,” said Pharis. “The Navy wanted to see how their sensors were operating in the field, (and) our U.K. partners were keen to learn how they were sharing coalition (intelligence, surveillance and reconnaissance resources).”

The exercise involved multiple intelligence disciplines such as geospatial, human, signals and counterintelligence, said Pharis.

U.K. forces were at China Lake and Langley Air Force Base, Va., where they worked with Canadian forces as part of a NATO element, said Lt. Col. Andy Page, British intelligence liaison staff to NGA. The U.K.’s main effort took place at that country’s

new geospatial intelligence building, Pathfinder, located at Royal Air Force Base Wyton, near Cambridgeshire, England.

The Pathfinder building was opened fairly recently and there was a large exercise contingent there, said Page. EC-13 was used to test how the new building works.

Some things didn’t go quite as planned, said Page, noting that exercises are designed to provide safe environments for systems and equipment to fail.

“You’re operating and playing with technology, and you’re trying to push it as much as you can,” said Page. “So, on occasion, this technology will fail. And, indeed, we did not achieve certain things that we would have liked to. We have given our engineers and scientists new problems to overcome. And, such is the nature of this exercise.”

Stanfill considered the three-week exercise a resounding success, he said.

“This is the best standards, conformance and performance testing I’ve ever seen outside of combat,” he said. ✨

Agency ‘broker’ unites NGA with academic opportunities

By Jason Moll, Office of Corporate Communication

NEARLY EVERY NGA DIRECTORATE IS ENGAGED IN academic outreach with institutions across the academic spectrum, from elementary schools to post-graduate programs.

The partnerships vary and include everything from guest speaker programs and workforce recruiting to joint research ventures, said Scott Loomer, NGA senior executive for academic outreach.

While partnerships generally benefit both parties, research is one area where benefits accrue to NGA, its partners and the nation, he said.

“Because companies are business oriented, they are looking for a relatively quick return on investment,” said Loomer. “That’s why basic research is almost entirely the province of academia. Basic research is something you don’t know will work, but if it does, it could be game changing.”

The success of NGA’s academic partnerships has led to the establishment of even more partnerships, said Loomer. In fact, what once required part-time oversight, is now a full-time job.

The NGA College appointed Loomer to the newly created senior executive position in 2012 to manage the agency’s growing academic outreach activities.

“There are literally a couple dozen academic programs spread across NGA,” said Loomer. “While the stewards of these activities are good at what they do, the

sheer volume and variety of programs has inhibited visibility across the agency.”

NGA’s status as an intelligence agency sometimes makes it difficult to be a champion for academic partners, said Loomer. Rather than creating another layer of bureaucracy, his job is to serve as a “broker” of sorts between institutions seeking NGA sponsorship and vice versa.

Of particular interest are partnerships with academia to address NGA Strategy-related training and education shortfalls, he said. For example, NGA recently issued a request for proposal for a course of study to broaden and deepen the analytical expertise of its mid-level GEOINT analysts.

Loomer’s work has internal and external components, he said. Internally, his office will be a resource where anyone within NGA can see the agency’s engagements or research agreements, said Loomer.

A newly created Page, called “Academic Opportunities” and located under the “Partners” link on the agency website, will help those in academia looking at NGA for partnerships, he said. (https://www1.nga.mil/Partners/Academic_Opportunities/Pages/default.aspx)

NGA members engaged or interested in academic outreach and members of academia interested in partnerships should contact Loomer at academia@nga.mil or 571-557-3379. ✨

NGA ACADEMIC RESEARCH PROGRAM

49 research grants with a value totaling more than \$19.9 million

NGA Academic Research Initiative 37 active grants, four pending, with 27 universities

IC Postdoctoral Research Program 4 active postdoc fellows with 4 universities

Historically Black Colleges and Universities/ Minority-serving Institutions, or HBCU-MI, Research Initiative 4 active grants with 4 universities

NGA Visiting Scientist Program 32 participants to date, 6 active, 6 pending 10 participants hired by government

U.S. Service Academies more than 1,600 cadets received GIS training

9 cadet summer interns at NGA

NGA Academic Outreach Activities

- InnoVision Italk speakers program
- Analysis Directorate guest speaker program
- Source Directorate guest speaker program
- Partners in Education program

Cooperative research and development agreements, or CRADAs

- InnoVision Academic Research program
- CRADAs
- 26 total CRADAs
- 6 academic CRADAs

[HTTPS://WWW1.NGA.MIL/PARTNERS/ACADEMIC_OPPORTUNITIES/PAGES/DEFAULT.ASPX](https://www1.nga.mil/Partners/Academic_Opportunities/Pages/default.aspx)



NGA teams with Howard U. students for GEOINT precision

By Jason Moll, Office of Corporate Communications

SEEKING A VERIFIABLE WAY TO MONITOR ATMOSPHERIC COMPOSITION AROUND THE CLOCK, SCIENTISTS from the National Geospatial-Intelligence Agency's InnoVision Directorate teamed with scientists from Howard University, in Washington, D.C., to share research and equipment.

The cooperative research and development agreement allows NGA scientists use of Howard's research facility in Beltsville, Md., where NGA has placed a microwave profiler radiometer, said Torreon Creekmore, Ph.D., an atmospheric scientist with NGA's InnoVision Directorate.

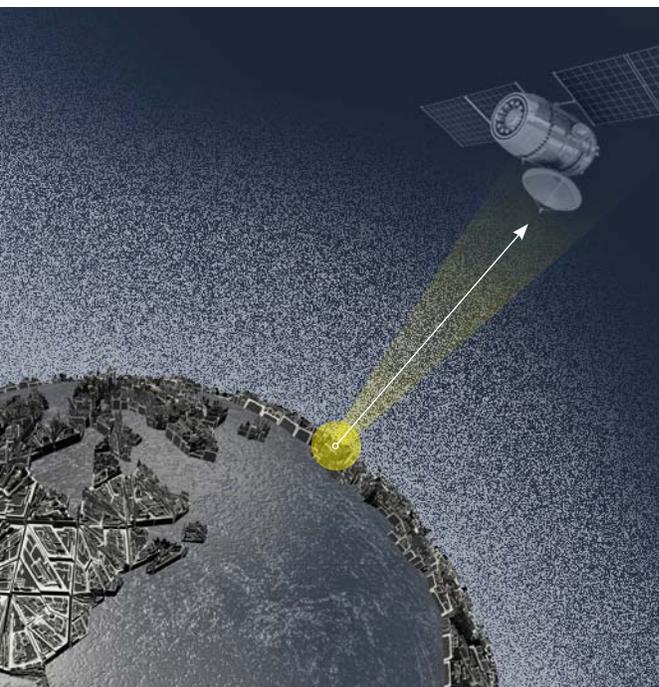
The instrument allows scientists to measure the amount of water vapor in an atmospheric column extending from the ground up to 6.2 miles.

"Measuring water vapor in the atmosphere lets us know how to correct the sensor data we're getting," said Creekmore. "Water vapor affects radiation as it travels from earth to space. Calculating the total amount of water vapor lets our satellites account for water vapor in the atmosphere and determine the real amount of energy coming from our targets on the ground."

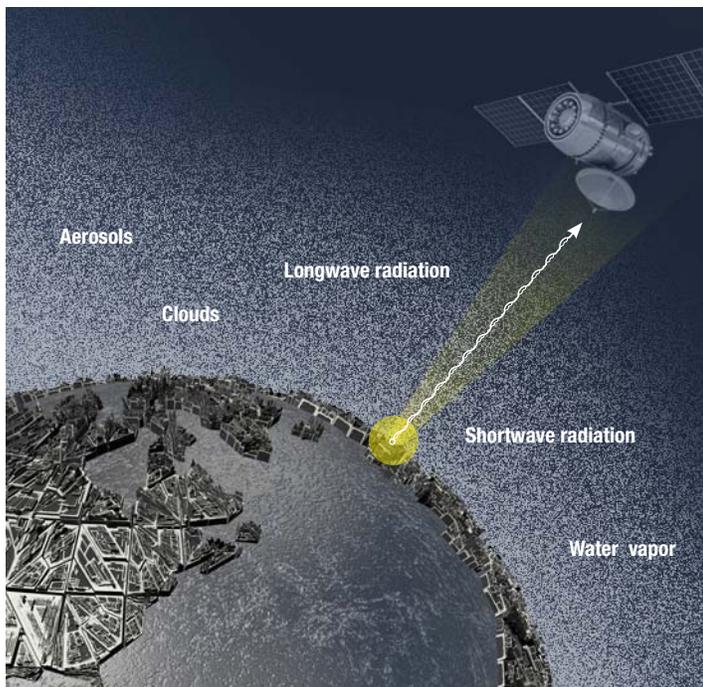
It is important for analysts to know what's between the sensors in space and the ground, said Creekmore.

"Even when the sky appears to be clear, there is a whole host of things, like aerosols, water vapor and clouds that affect the data I'm getting," said Creekmore.

NGA and Howard scientists are using the microwave profiler radiometer to develop a proof of concept that measures water vapor by receiving microwave energy from the atmosphere, said



The U.S. government relies on intelligence satellites to take pictures (imagery) and acquire data with sensors. Electromagnetic radiation, or light, is particularly important.



Water vapor and aerosols affect energy and light as it travels from earth to space, limiting the accuracy of sensor data readings.

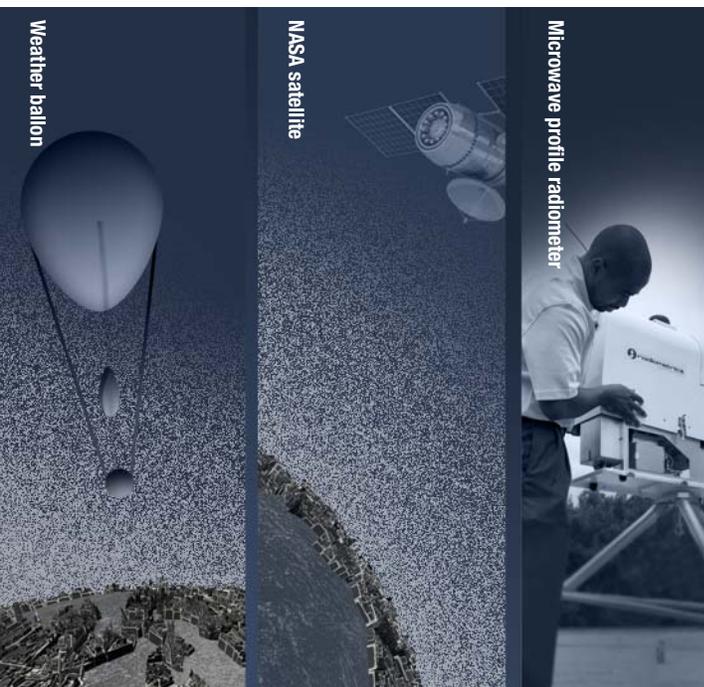
Creekmore. Scientists hope to use this method to calibrate radiosondes, or weather balloons, and satellites as they perform their own measurements, and to create models that allow them to indirectly gauge atmospheric conditions worldwide.

Howard has a microwave profiler radiometer of its own and other instruments that help NGA scientists corroborate and verify the data they receive, said Everette Joseph, professor of physics and astronomy at Howard and director of the Beltsville Center for Climate System Observation.

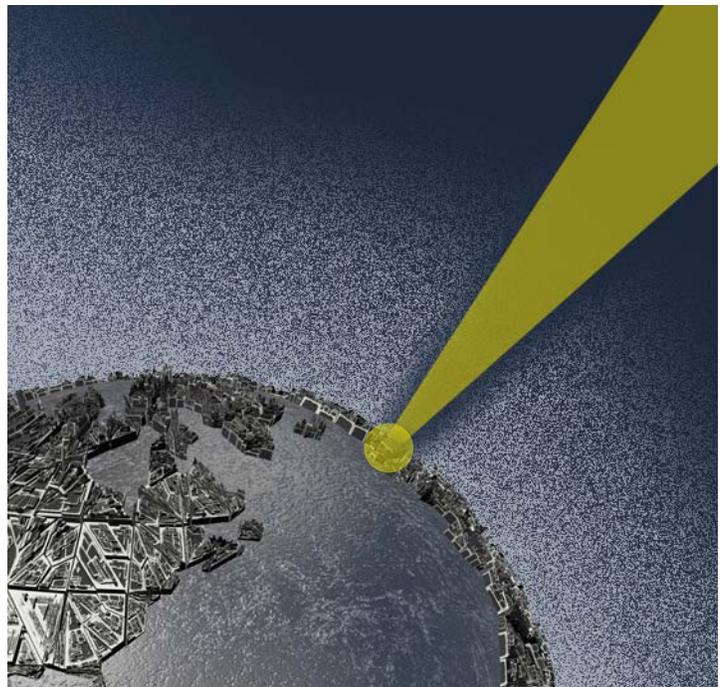
“There are subtle differences from one instrument to another, and we’re able to get a sense of that by comparing the data we get (from each of them),” Joseph said. “We also have more established methods of measuring atmospheric water vapor, such as using a radiosonde and (light detection and ranging).” NGA’s partnership with Howard provides agency scientists with access to their peers in academia and other federal agencies and exposes Howard students to working scientists and the intelligence community.

“The students help me take measurements (and) install and characterize the instrumentation,” said Creekmore. “I’m helping another student with his Ph.D. research and publish a paper. So, things that I know, I help them on, and things that they might know, they help me on.”

NGA’s interaction with Howard’s students has also helped bolster technical education among those who come from traditionally under-served populations, said Joseph. ✨



Scientists use different methods to analyze the atmosphere's composition



By using a microwave profile radiometer, NGA and Howard scientists hope to develop techniques that allow them to subtract water vapor atmospheric effects on sensor-received data.

NGA team changes USAF approach to Djibouti

CRASH

Investigation

By Kris Mackey, Office of Corporate Communications

U-28s, like the one that crashed in Djibouti, provide manned, fixed-wing, on-call surge capabilities for tactical airborne intelligence, surveillance and reconnaissance in support of special operations forces. U.S. Navy Photo.

MEMBERS OF A NATIONAL GEOSPATIAL- Intelligence Agency support team in the Horn of Africa used GEOINT methods to change the way the U.S. Air Force investigated a plane crash in February 2012.

The on-site Air Force team used these methods to document and investigate the crash of a U-28 reconnaissance plane at Camp Lemonnier, Djibouti, in the Horn of Africa, said Jason Parrish, a member of NGA Geospatial Support Team 17.

The investigators were unaware of the support team's capabilities when they came to GST-17 looking for handheld GPS equipment, said Parrish. GST-17 gave the investigators much more, taking them beyond the traditional method of hand

drawing maps of the crash site. The team provided investigators a more realistic depiction of the site through commercial imagery and overlays detailing the terrain and pinpointing the debris.

"I labeled each of the points using GPS," said Parrish. "Admittedly, it led to a very busy and crowded product because the debris was close together. (But) I knew (our product) could provide more clarity to the investigators, so I kept at it."

The more the investigators saw of NGA's capabilities, the more they wanted, said Parrish.

The final suite of NGA products consisted of four maps – two unclassified and two at the FVEY level, said Parrish. The maps accurately represented precise

locations within the debris field. This provided an electronic record that became instrumental in reconstructing the scene and the cause of the accident.

Some of the GEOINT was also presented to the families of the crash victims to show where and how the event occurred, said Parrish.

"NGA's support is an imperative element during these events, as we supply the geospatial context of exactly where events unfold," said Art Gregory, the site lead at the time of the crash. "Often, the only information the crews have with them when they depart for such an incident are customized NGA products guiding them to their destination."

He and his team were working late with members of Combined Joint Task Force-Horn of Africa on the evening

Integrated intel focus of NGA-hosted workshop

By Al Schulte, Office of Corporate Communications (Editor's note: Scott Michaud, ADF-Denver, contributed to this story.)

TO THE THOUSANDS OF NGA, NSA, NRO, military and contract employees who work at the Aerospace Data Facility in Aurora, Colo., or ADF-C, the phrase “integrated intelligence in action” holds two meanings. It is an apt description of the ADF-C’s collaborative spirit, and it was the theme for a recent technical workshop held at the facility.

Hosted by NGA-Denver and co-sponsored with the U.S. Geospatial Intelligence Foundation, the NGA Technical Workshop was a three-day event held in the Denver area and at the ADF-C on Buckley Air Force Base.

The workshop’s goal was to develop multi-INT tradecraft and tools for enhancing mission effectiveness, and delivering top-notch service to NGA, the IC and to customers around the world, said NGA-Denver Director Ed Mornston, who welcomed more than 170 IC, DOD and industry attendees to this year’s session.

The “in action” part of the theme means that our customers can do something or make decisions with the integrated intelligence ADF-C provides, said keynote speaker Robert Cardillo, deputy director of national intelligence for intelligence integration.

“ADF-C has intelligence integration in its DNA,” Cardillo told facility employees there. “There is no time when what you do has been more important than today.”

ADF-C continues to serve as a model for successful intelligence integration and collaboration, and

NGA’s continuing partnership with agencies such as the NSA and NRO help us live up to DNI Clapper’s expectations for the rest of the IC, said Mornston.

USGIF Chief Executive Officer Keith Masback pledged his organization’s commitment to strengthening the partnership between industry and the DOD, and to growing the GEOINT community.

NGA Chief Operating Officer Ellen McCarthy addressed the attendees via VTC, and said she supports a strong public and private partnership and that industry partners are crucial to providing solutions in technology, training and management for NGA.

“NGA is at the forefront of bringing all of the -INTs together, and so it is only fitting that this event is being hosted at NGA-Denver because it serves as a model for collaboration and integration,” McCarthy said.

“NGA’s future lies in finding the unknowns – predicting targets, and utilizing new technologies and training to identify new threats,” said McCarthy.

There are challenges, particularly caused by sequestration, but NGA will meet those challenges, and continue to invest in unclassified, open source, social media and commercial imagery, said McCarthy.

NGA-Denver and NSA-Colorado partner to create a fusion of GEOINT and SIGINT called GEOSIG, said Bruce Leiman, NGA-Denver deputy director. By collecting other forms of

mission intelligence and compiling the data into a single product, stakeholders can have a more complete site picture on which to base their decisions.

An operational vignette briefing on integrated intelligence collection, titled “As Collected Monitoring Service,” was delivered by Aaron Shankles, NGA, and an NSAC representative.

“When you integrate people from different intelligence expertise and cultures, and co-locate them into a facility like the ADF-C, it leads to success,” said Shankles. “Integrated collection processes are being applied to various issues every day.”

A discussion panel on the state of integration was moderated by Neil Tipton of ODNI. The discussion included panelists from U.S. Northern Command, the National Counter-Terrorism Center, NSA and contracting company CACI.

Tipton referred to the ADF-C as the poster child for intelligence integration, and an NSAC panelist attributed the effective operations of ADF-C to a sense of coalition leadership in its community. NGA-Denver seniors participated in an off-site speed mentoring workshop July 18, sponsored by USGIF.

“We go to a lot of government-sponsored conferences, maybe 20 a year, and this was one of the most informative and actionable sessions we’ve attended,” said an attendee. “It gave us exposure to real-world initiatives that help us better understand the needs of the intelligence community.”✱



Panel members discuss topics and field questions from attendees at the event. NRO Photo.

NGA welcomes distinguished guests

Photos by Tony Boone, Office of Corporate Communications



Chief of Naval Operations Adm. Jonathan Greenert re-enlists petty officers first class Aaron Marrison and Tom Wince, both Navy intelligence specialists, Oct. 9 during the National Geospatial-Intelligence Agency's celebration of the Navy's 238th birthday in Springfield, Va. Greenert was the keynote speaker for the birthday ceremony.

NAVY BIRTHDAY

"NGA is the foundation of how we get around, how we know where to go and navigate safely."

- Greenert



Retired Army Gen. Stan McChrystal speaks to members of the National Geospatial-Intelligence Agency's workforce Oct. 28 at the agency's Springfield, Va., campus. The former commander of U.S. and international forces in Afghanistan was the first speaker to participate in the new NGA Director's Distinguished Speaker Series. McChrystal now teaches a leadership course at Yale University and is the co-founder of the McChrystal Group.

NGA Director's Distinguished Speaker Series

"Senior leaders (must) trust junior leaders and challenge them."

- McChrystal

NGA responds to Colorado floods

Office of Corporate Communications

WHEN FLOODS DEVASTATED PARTS OF COLORADO IN SEPTEMBER, the Federal Emergency Management Agency, the lead federal agency for response to the Colorado flooding, called the National Geospatial-Intelligence Agency for help.

In response, NGA deployed two analysts to Boulder and Loveland, Colo., and launched its suite of analysis and collaboration tools to aid search and rescue efforts and provide flood and damage assessments.

NGA's disaster event page is a hub for accessing NGA's products and services. Through this unclassified Web page, federal, state and local response partners are able to submit and review requests for geospatial information and specific analysis needs, view and download NGA products such as maps and graphics that illustrate areas and extent of damage, and contribute information for the combined response effort.

NGA launched its first disaster event page for the response to Hurricane Sandy in October 2012. The collaboration tool is now a standard component of NGA's disaster-response service, and the agency creates a page as soon as a lead federal agency asks for help.

As is often the case in disaster response, weather and cloud cover made analyzing conditions in Colorado more challenging. Multiple sources of data and imagery, including commercial news reports and information found in publicly available social media streams, had to be evaluated along with commercial imagery and other traditional information sources.

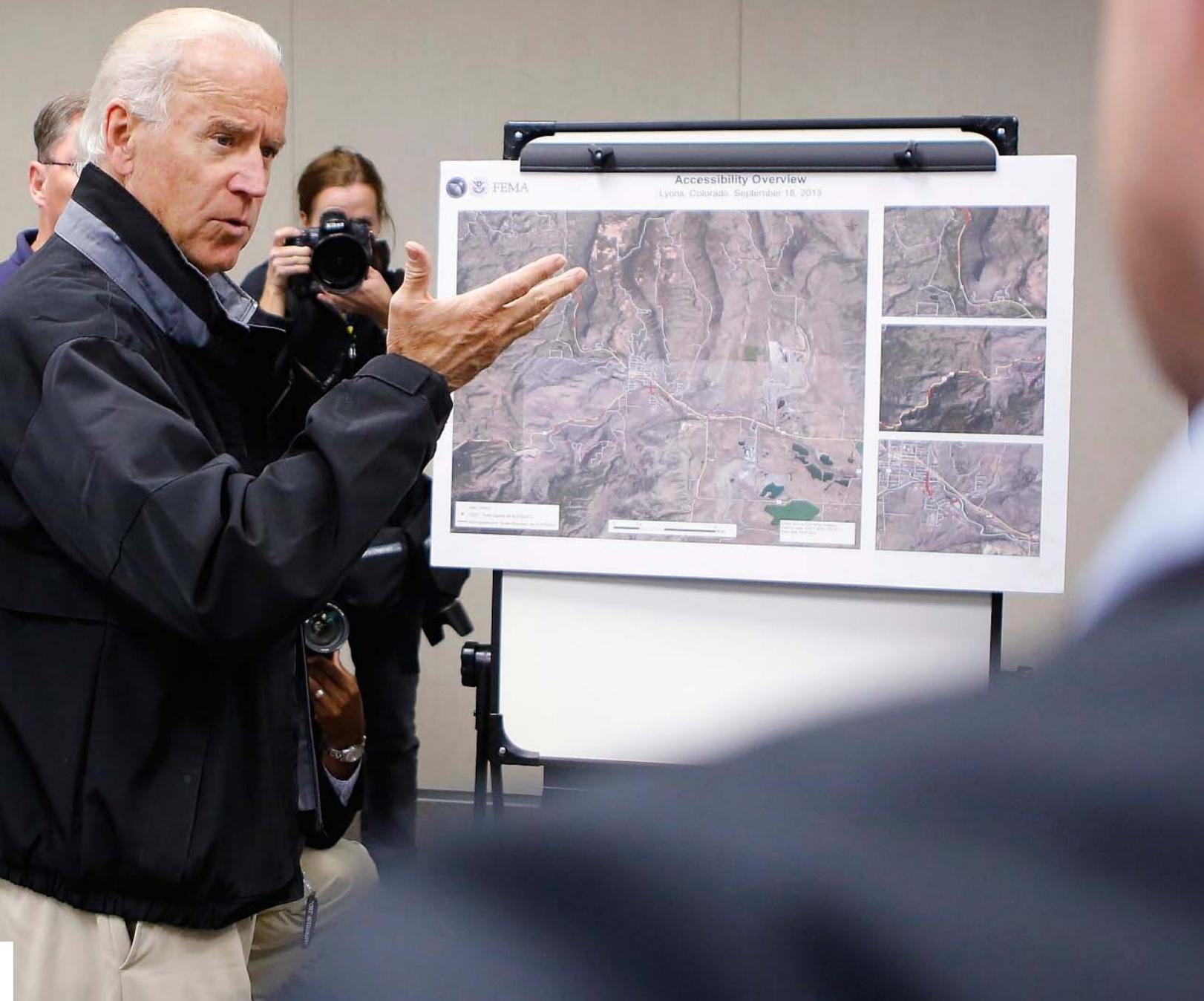
The agency's new GeoQ system makes that multi-source analysis more efficient. GeoQ integrates imagery and analysis from multiple sources and geographically dispersed analysts and better facilitates the use of crowdsourcing to define areas and extent of damage. It enables analysts to review imagery from different sources simultaneously, rather than sequentially, which results in much faster damage assessments. This allows responders to appropriately focus and prioritize limited resources.



An aerial view shows flood damage in Colorado, Sept. 14 caused by heavy rains. NGA deployed analysts and launched a suite of analysis and collaboration tools to help search and rescues and provide flood and damage assessments. U.S. Army photo by Staff Sgt. Wallace Bonner.



NGA's graphic depiction of search areas allowed rescuers, like these soldiers evacuating fifth-grade students, to narrow their focus. U.S. Army photo by Staff Sgt. Wallace Bonner.



Vice President Joe Biden discusses Colorado flood damage during a visit to the Federal Emergency Management Agency's disaster recovery center in Greeley, Colo., Sept. 23. An NGA assessment of damaged and closed roads helped illustrate the impact of the flooding. AP Photo/Ed Andrieski

NGA specifically assisted with identifying areas of damage and assessing the extent of the damage. Because the Colorado floods did not follow a predictable river- and stream-bed pattern, typical modeling techniques could not be employed, which has made NGA's imagery-derived damage assessments more critical.

NGA identified more than 3,000 damaged structures in the greater Denver and Boulder areas. The NGA flood and damage assessments resulted in disaster declarations in numerous counties.

In addition, NGA aided urban search and rescue operations by graphically depicting where searches already had occurred and tracking search-and-rescue personnel

movements via GPS logs. This type of analysis allows first responders to better manage response efforts, and avoid duplicating searches or missing damaged structures.

Through the disaster event page, NGA is providing information and geospatial intelligence to everyone involved in disaster response in a self-serve, on-demand format. In addition, NGA analysts on the ground and the team at headquarters assisted responders with more complex, specific analysis when needed. By streamlining the processes and making finished products easily available through the event page, NGA was able to focus analysis efforts on the harder problems confronting the response effort. ✨

GEOINTERESTING



DENALI NATIONAL PARK AND PRESERVE, ALASKA
North America's highest peak is taken down a notch, and runner-up Mount Logan's hopes soar. Mt. McKinley, also known by the Native Alaskan name

Denali, clocked in at 83 fewer feet than previously believed, according to data recently released from a 2010 radar collection flight. Experts say the mountain, like much of the state, is difficult to map due to shifting ice and snow that alter the landscape. Many of Alaska's topographical maps date to around the time of its statehood in 1959.

SOURCE: WWW.NPR.ORG



GALAPAGOS ISLANDS, ECUADOR
Plan your giant tortoise and blue-footed booby sightseeing now. Google Street View spent 10 days in the islands, capturing ground and underwater footage. The images will be added to Google Maps in late 2013.

SOURCE: WWW.TECHCRUNCH.COM



MISSISSIPPI DELTA, UNITED STATES
All roads lead to Rome – or, in our case, all creeks lead to the mighty Mississippi. We loved exploring America's largest river. Find your favorite tributary on the National Atlas Streamer Map, a new app that lets you trace the up- or downstream routes of any waterway in the U.S.

SOURCE: WWW.NATIONALATLAS.GOV



PERU
Purported alien activity isn't the only thing that Machu Picchu, the Nazca Lines and other ancient Peruvian ruins have in common. All are now being monitored in 3-D by drones previously used only by the military. Increasingly inexpensive and available, drones are speeding up normally sluggish mapping work and protecting fragile heritage sites from squatters, builders, thieves and miners.

SOURCE: WWW.REUTERS.COM



GREENLAND
The view from this skywalk won't be for the faint of heart. Using three decades' worth of radar data, scientists have discovered a fissure nearly twice the size of the Grand Canyon beneath the Greenland Ice Sheet. It is believed to have originated as a system of rivers in the bedrock at least 4 million years ago.

SOURCE: WWW.NATIONALGEOGRAPHIC.COM



SOURCE:WWW.TELEGRAPH.CO.UK

LONDON, ENGLAND
One round-trip ticket to Fruit Cake and Drippings, please. A U.K. man created a "flavor map" of the London Underground, assigning a taste to stops on the rail line. His 49-year project resulted in a clear winner: Baker Street, apparently tasting of a jam cake. Least popular? St. Paul's, which imparts the flavor of soft, mushy sprouts.



SOURCE:WWW.WASHINGTONPOST.COM

AUSTRIA
Even 16th-century mapmakers knew to warn would-be explorers of dangers. Inscribed with "here be dragons" in Latin, two conjoined halves of an ostrich egg form what may be the oldest globe depicting the New World. After it was purchased at a map fair in 2012, an Austrian collector spent a year analyzing the globe, dated 1504.
Photo: Washington Post



OKAVANGO DELTA, BOTSWANA
Scientists turn their gaze from the stars to the stripes – black-and-white stripes, that is. Using NASA rain and vegetation data, researchers can now anticipate and track zebra migration as the animals make a 360-mile round trip to Makgadikgadi Salt Pans, following rain-driven grass growth.



SOURCE:WWW.NASA.GOV



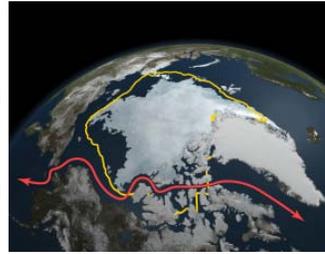
THE NORTHEAST PASSAGE, ARCTIC CIRCLE

Like any good bargain, the "shortcut" across the top of the world was available for a limited time only. Due to melting ice, the Northeast Passage opened to shipping traffic for a brief window this summer. Boats from Shanghai to Rotterdam used the temporary route above Russia to shave about seven days and 2,750 miles from their travel. Experts hope for continued summertime use of the new route.

Photo: NASA



SOURCE:WWW.PBS.ORG



Liz Sherman began at NGA as a young analyst working on issues in the Horn of Africa. Today, she is a branch chief responsible for an integrated working group of professionals focusing on that region.

She became interested in the region in 1993 as a newspaper reporter in Georgia covering the 24th Infantry Division, now known as the 3rd ID, she said. The unit was tasked with extracting American forces after 18 American soldiers were killed by antigovernment Somalis when their Black Hawk helicopter crashed in Mogadishu. She continued her studies of the region in graduate school.

"Working Somalia issues for the intelligence community is a dream come true for me," said Sherman, whose husband also works for the agency.

As a manager, she is also responsible for implementing the NGA Strategy and guiding her branch through the changes associated with a new way of doing business, she said. She was unsure how to motivate people entrenched in their work styles to shift their paradigms from information hoarding to information sharing. She sought the answers through leadership courses offered by the National Geospatial-Intelligence Agency College.

"The courses have taught me better resiliency skills and helped me learn how to motivate people when they feel the strain of rapid change," said Sherman. "This is really about making ourselves change the way we think. Change is not easy, but once we get into the right mindset and embrace and internalize the need for institutional change, we bring more to the table and offer more to NGA's customers."

Sherman loves her job and believes what she and her team do is important, she said.

"I wake up excited about coming to work, and I go home fulfilled, knowing I did something worthwhile. I no longer feel like I'm 'just an analyst.'"

I am NGA."



Photo by Tony Boone, Office of Corporate Communications



I am **INGA**

National Geospatial-Intelligence Agency

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