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NGA's 'New Power'

NGA Director Presents Revised Strategy Focused on Openness, Innovation

If National Geospatial-Intelligence Agency (NGA) Director Robert Cardillo could enjoy a cold one with any historical figure, there's a good chance the self-proclaimed "beer snob" would pick Socrates. Although Socrates is known for drinking hemlock, not hops, the ancient Greek philosopher would understand well what Cardillo touted Tuesday morning during his keynote address at GEOINT 2015: the principles of openness and inquisitiveness.

Like Socrates, who was famous for questioning established beliefs, Cardillo—who noted a staggering increase in the number of NGA personnel attending the GEOINT Symposium this year due to its D.C. location—intends to challenge the status quo during his tenure as NGA's sixth director.

"For decades intelligence was like a regulated currency. We guarded it jealously; we controlled it tightly," said Cardillo, quoting a December 2014 *Harvard Business Review* article by Jeremy Heimans and Henry Timms, who referred to this "currency" as "old power." "They called [old power] 'closed, inaccessible, and leader-driven. It downloads and it captures.' As a currency, hoarding is a good thing ... But in today's world our enterprise must operate differently. Less like a currency and more like a current."

Instead of old power, Cardillo said, NGA needs new power.

"New power is made by many," he continued. "And again I quote [Heimans and Timms]: 'It is open, participatory, and peer-driven. It uploads and it distributes. The goal with new power is not to hoard it but to channel it.'"

Replacing old power with new—at NGA and across the GEOINT Community—demands not only new ideas, but also new objectives,

→ see NGA's 'New Power' p.10



NGA Director Robert Cardillo discussed the differences between "old power" and "new power" and introduced four strategic goals for NGA during his keynote Tuesday.

"New power is made by many."

—Robert Cardillo, Director, NGA



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A CHALLENGE TO INDUSTRY

Panel to Discuss the Future of Human Geography

Human geography, an emerging area within geospatial intelligence, will be the focus of a GEOINT 2015 breakout panel discussion Thursday at 1 p.m. in Room 146.

Robert Cardillo, director of the National Geospatial-Intelligence Agency (NGA), will give an introductory keynote for the panel, which will highlight human geography efforts in the federal government, international organizations, and academia as well as discuss how industry can better support this emerging discipline.

Panelist Brian Hagan, NGA's national geospatial intelligence officer for geography and cartography, is expected to issue a challenge to companies and encourage them to include human geography data, mapping, and analysis in the intelligence products they provide to government.

"Human geography is at the heart of the GEOINT mission by portraying and mapping the human presence, activities, and patterns within the physical environment," Hagan said.

In addition to Hagan, panelists will include: Dr. Melinda Laituri, a Jefferson science fellow with the U.S. State Department's Humanitarian Information Unit; Lea Shanley, NASA Presidential Innovation Fellow; Nicole Sponaugle, chief of the Defense Intelligence Agency's Operational Environment Analysis Division; Godfrey Takavarasha of the United Nations Office for the Coordination of Humanitarian Affairs; and Mike Williams of the University of South Florida's Global Initiative on Civil Society and Conflict.

Human geography aims to show what people do, where they do it, and why, said Booz Allen Hamilton Principal Justin Sherin, who is organizing the session and will serve as the panel's moderator. The discipline spans 13 theme areas: communications, demographics, economy, education, ethnicity, groups (civil, political, and ideological), land (use, cover, and ownership), language, medical/health, religion, significant events, transportation, and water.

"The world has changed significantly in the last 30 years—globalization, technology advancements, and new threats to human security," Hagan said. "In today's world, you need to have more context than just where things are on the ground."



A Thursday afternoon breakout session will discuss the future of human geography—which aims to show what people do as well as where and why.

PHOTO COURTESY OF U.S. AIR FORCE; BRIAN FERGUSON

"In today's world, you need to have more context than just where things are on the ground." — Brian Hagan, NGA

Human geography has supported recent military operations as well as responses to the Ebola virus outbreak and Nepal earthquakes. Geospatial data is also becoming increasingly essential to understand climate change and its implications for society within a human geography framework.

The role of "the human geography community is to coordinate and share human geography data and leverage the associated analytic methods," Hagan said. ■

FROM THE



PHOTO COURTESY OF HP

HP features an interactive NASCAR game at its GEOINT 2015 booth to assist visitors in identifying their business challenges and learning ways the company can help.

HANDS-ON PROBLEM-SOLVING

HP Invites Booth Visitors to Participate in Interactive Discussions

HP (Booth 7093) offers a pit stop in the GEOINT 2015 exhibit hall. You will recognize the HP exhibit by the line of prospective NASCAR drivers. The company is offering hands-on, interactive demonstrations to booth visitors, and particularly hopes to attract program and executive operations managers for discussions of mission needs and potential solutions. The race is just one of such demonstrations.

“We call it a ‘race to a new style of business,’” said Juli Ballesteros, HP’s manager of media and public relations for its U.S. Enterprise Services. “Customers can pick three business challenges they have. The NASCAR game has them answer a question about each challenge. They’re rewarded or penalized during the race. It’s a fun and interactive way for them to identify an area that they’ve found particularly challenging and how HP can help with it.”

Another demo called “Shark Tank” highlights HP’s converged infrastructure systems, and the company is also showing security software as well as personal computers and printers with updated capabilities.

Ballesteros said HP has worked with the Intelligence Community for more than a half century.

“[The GEOINT Symposium is] an opportunity for us to get in front of a wide array of IT people to make sure they are aware of the service capabilities we have,” Ballesteros said. “We may be able to help them implement solutions by leveraging technology in some new ways that they haven’t thought about.”

GEOINT & SMALL BUSINESS

Opportunities for Small Businesses at GEOINT 2015

GEOINT 2015 marks the second year a Small Business Pavilion is featured in the exhibit hall. This area houses 28 small business exhibits and provides the opportunity for these organizations to network with one another while showcasing their products and services for GEOINT Symposium attendees.

Additionally, USGIF’s Small Business Advisory Working Group (SBAWG) will host a special presentation Wednesday at 1 p.m. in Room 305 titled “NGA & Small Business: Turning the Corner.” National Geospatial-Intelligence Agency (NGA) representatives Mike Geggus, industry innovation advocate, and John Goolgasian, director of source operations & management, will be among the panelists. The SBAWG will also host a networking reception Wednesday at 4 p.m. in the Small Business Pavilion of the exhibit hall.

Companies exhibiting in the Small Business Pavilion include:

- Airborne Resources Inc.
- Bay Microsystems Inc.
- Brimrose Corporation of America
- C2S Consulting Group
- CliQr Technologies
- Coho Data
- CRI
- DataFission
- Edgetide
- First Mile Geo
- Geo Owl
- GeoNorth LLC
- HySpecIQ
- CES
- Mappt
- Mapsense
- Meadowgate Technologies
- New Light Technologies
- North Avenue Technologies
- OakStream Systems LLC
- OmniEarth
- Pherson Associates
- S2 Analytical Solutions
- Scala Storage
- Spaceknow Inc.
- TeKnoluxion
- Transcend Spatial Solutions
- Veem Software

FLOOR

EXHIBIT HALL HIGHLIGHTS

FORCE MULTIPLIER

NerVve Showcases Rapid Video Search Tools



NerVve's automated technology can search one hour of video in five seconds.

PHOTO COURTESY OF NERVE

NerVve Technologies (Booth 8052) is on a mission to be a “force multiplier” for GEOINT analysts. Their automated technology can search massive amounts of data for objects of interest very quickly — one hour of video in five seconds, for example.

NerVve tools can help advance activity-based intelligence by exploiting visual information to reveal patterns of life, according to company President and COO Joe Cecin.

Cecin describes NerVve's products as “automated tools to make analysts more effective in targeting objects of interest in a tsunami of data.” The system even sends analysts alerts when objects of interest are identified.

Headquartered in Buffalo, N.Y., NerVve is expanding its presence at the GEOINT Symposium this year in order to offer more demonstrations of its technology.

“We will have several members of our team here to talk about our company, explain the technology, and give demonstrations of how we search video and imagery both live and forensically,” Cecin said.

ANALYTIC EXCELLENCE

Novetta Emphasizes Open-Source Intelligence

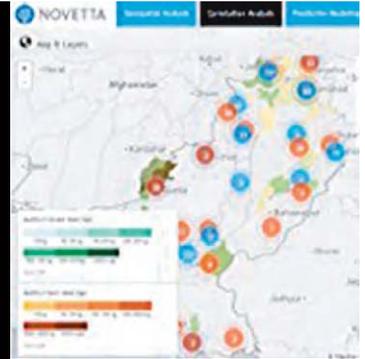
There's strength in numbers — not only among warfighters, but also among the private-sector companies that support them. **Novetta (Booth 10077)** is proof. Born of a merger of four companies in 2012, the company has since absorbed four more firms, concentrating the expertise of eight businesses into a single package focused on advanced analytics for government and commercial customers.

Although Novetta is best known for its cybersecurity solutions — in 2014 it led a first-of-its-kind cybersecurity coalition that interdicted the malware activities of threat actors across the globe — its focus at GEOINT 2015 is the next frontier of data analytics for national security: open-source intelligence and social media exploitation.

“We'll have at least three different demonstrations in our booth,” said Andrea Keilholtz, Novetta's senior director of corporate business development. “One will be the geospatial support that we give to JSOC through our contract with them, which has a lot to do with open-source information and intelligence, video exploitation, Big Data analytics, and entity resolution; one will be our product that does multi-INT analysis for DoD customers; and the third will be capabilities from a company we acquired called Global News Intelligence, which uses social media and sentiment analysis to build open-source intelligence.”

On hand to assist with all three demonstrations are Novetta's senior managers, who are particularly excited about the latter demo.

“We have a lot of offices and consultants in the Middle East and Africa, so we'll be showcasing the sentiment analysis we're doing in those high-profile areas,” Keilholtz said.



Novetta's open-source intelligence solutions convert social and traditional media into exploitable information.

IMAGE COURTESY OF NOVETTA

THE EARTH IN 3D

Vricon Makes a Splash as a New Provider of 3D Earth Imagery



PHOTO COURTESY OF VRICON

Vricon provides 3D images of Earth, such as this one of Damascus, Syria.

Vricon (Booth 4083), a new joint venture between DigitalGlobe and Saab, unveils its three-dimensional Earth imagery products at GEOINT 2015.

Based in Reston, Va., Vricon combines Saab's 3D modeling technology with DigitalGlobe's archive of billions of square kilometers of commercial satellite imagery. Unlike traditional methods, which can create a 3D image of only one building or small area at a time, “we build entire cities and entire countries in an almost completely automated fashion,” said Craig Brower, Vricon vice president.

To create a 3D view of a particular scene, Vricon software first taps into DigitalGlobe's library of two-dimensional, high-resolution images of Earth's entire land mass. The software then combines images from multiple vantage points to create a textured, photograph-like 3D model.

Vricon, which announced its formation in late May, is building a global 3D database on its own dime and expects to recoup its investment by charging customers for access. The company uses tools that minimize the amount of computer memory required to render and visualize the 3D data, allowing customers to easily use its products online or offline, Brower said.

“Deliveries can be made through the cloud within hours of placing an order,” the company declares on its website.

Vricon envisions many potential uses for its products, such as assisting troops in planning an urban operation or helping a security team determine a safe route for a traveling dignitary.

“We expect there to be an awful lot of interest,” Brower said.



GEOINT 2015 FAMILY DAY

Activities for All Ages Offered Thursday in Exhibit Hall

Tomorrow, GEOINT 2015 attendees are encouraged to bring their families to the exhibit hall from 12:30 to 3 p.m. for the Symposium's inaugural family day.

Your family can learn more about the world of GEOINT by exploring the exhibit hall and witnessing the technologies offered by more than 280 exhibitors. Face painting, special booth giveaways, and family-friendly food and beverages will be available.



GEOINT 2015 attendees are invited to bring their families to tour the exhibit hall and learn about geospatial intelligence Thursday afternoon.

USGIF's Young Professionals Group will host a special family activity called the ScavenGeo Dash from 1 to 3 p.m. The ScavenGeo Dash is an educational scavenger hunt consisting of challenges designed for all ages. From simple imagery analysis to identifying satellite components using Lego models, the challenges help participants learn basic GEOINT knowledge. Prizes will be awarded for several categories including first, second, and third place awards for teams that complete the challenge in the shortest amount of time.

About 60 eighth through twelfth graders from Anne Arundel County Public Schools' summer STEM program will also tour the exhibit hall.

Continue this day of family fun by attending the Washington Nationals vs. Atlanta Braves baseball game at Nationals Park beginning at 4:05 p.m. Discounted tickets are available for purchase at registration, and each \$30 ticket includes \$15 of food and drink.

GEOINT & WILDLIFE SECURITY

Wednesday Afternoon Panel Connects Animal Trafficking to Global Security

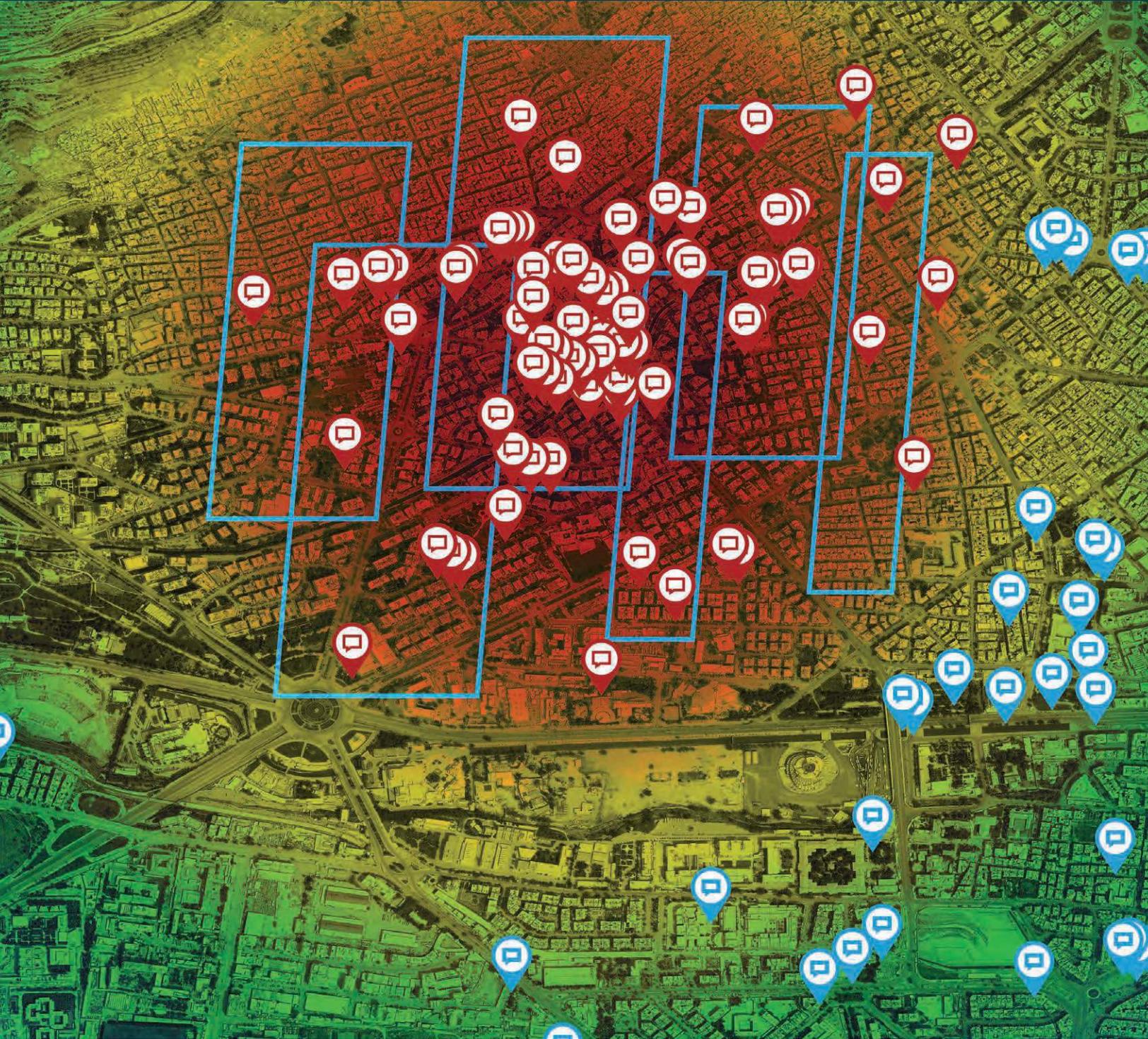
A special presentation will be held Wednesday at 1 p.m. in Room 303 exploring the connections between national security, geospatial intelligence, and wildlife trafficking. Countering violent extremism and protecting endangered animal populations in Africa may seem like two completely different missions, but they have more in common than meets the eye. With the black market profits of ivory from elephant and rhino horns funding a terror war, non-governmental organizations and park rangers often find themselves on the front lines of conflict. According to various estimates, more than 100,000 African elephants were poached for their ivory between 2011 and 2013, and since 2007, rhino poaching has increased by a staggering 9,000 percent. The illicit wildlife trade is a high-stakes game that is perpetrated by sophisticated and globally organized criminal networks. The trade funds violent extremism, fosters radicalization in developing regions, and fuels government corruption. It will, if left unchecked, result in a global biodiversity and environmental crime crisis with irreversible consequences. This panel will discuss the need for holistic wildlife security strategies that are information-driven, leverage geospatial technologies, and are inclusive of government and non-government stakeholders.



According to various estimates, more than 100,000 African elephants were poached for their ivory between 2011 and 2013.

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PENTAGON EYES GEOINT UPGRADE

Deputy Secretary of Defense Calls for 'Patterns of Life' Intelligence



The Honorable Robert Work, Deputy Secretary of Defense, talked about doubling down on GEOINT in the future and the importance of making space systems more resilient during his Tuesday keynote.

Deputy Defense Secretary Robert Work called for dramatic improvements in the GEOINT products available to the Department of Defense during his GEOINT 2015 keynote speech Tuesday.

“When we discuss and debate what space capabilities we need to improve on, GEOINT is going to remain at the top of the list,” he said.

Work acknowledged the GEOINT Community already provides vital products to warfighters, such as exquisite imagery, detailed maps and charts, data for high-fidelity mission planning systems, change detection, targeting support, and three-dimensional renderings of buildings and compounds. But he said the Department of Defense needs even better intelligence to maintain its technological edge on the battlefield.

“We’re going to double down on GEOINT in the future,” he said. “We want to be able to establish patterns of life from space. We want to know what the unusual looks like.”

Work offered several examples of the patterns of life he is looking for.

“All of a sudden, if a lot of cars show up in the parking lot of an adversary’s missile plant, we want to know about it and we want to know about it quickly,” he said. “If, suddenly, small boats are swarming in the [Persian] Gulf or pirates are starting to congregate off Aden, [a seaport city in Yemen], we want to know. If Russian soldiers are snapping pictures of themselves in war zones and posting them on social media sites, we want to know exactly where those pictures were taken. If people start

to build structures on islands in the South China Sea, we want to know about that. And if [there is] a ship we suspect might be carrying missile materials, we want to know how deep it’s sitting in the water so we can determine how much cargo is on board.”

Work said producing such intelligence will not be easy, as it requires sifting through a “massive amount of data.” In addition, such

“All of a sudden, if a lot of cars show up in the parking lot of an adversary’s missile plant, we want to know about it and we want to know about it quickly.” — Robert Work, Deputy Defense Secretary

information must be provided quickly because technology is shortening reaction times. He said the DoD will have to rely more heavily on private-sector innovation to provide such services.

Work also discussed space-based systems that aid GEOINT and other forms of intelligence, saying they will be increasingly vulnerable to attack by emerging, potentially adversarial powers such as China and Russia. The “virtual sanctuary” that the United States enjoyed in space for the past 25 years due to its “unparalleled” capabilities will become much more contested in the next 25 years, he predicted.

According to Work, the Defense Department redirected about \$5 billion in its FY16 budget request to improve space security, and an ongoing strategic portfolio review is underway to determine whether more funding increases are in order.

The DoD needs to make its space systems more resilient, Work said. “If we fail to do so, the implications for our national security will be quite profound. Our command and control will be significantly degraded. Our ability to detect and track adversary ballistic missile launches will suffer. The accuracy of our precision-guided munitions will be put into question. Satellite links that connect our unmanned aerial systems will be denied.” ■



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THE GEOINT-SOF RELATIONSHIP

Synergy Between Geospatial Intelligence and Special Forces Will be Critical to Emerging Threats

An evolving relationship between the Geospatial Intelligence Community and Special Operations Forces serves as a key mechanism to help the U.S. function within a changing world, Theresa Whelan said in her keynote address Tuesday at GEOINT 2015.

“In many ways, we are in a back-to-the-future mode,” said Whelan, principal deputy assistant secretary of defense for special operations/low-intensity conflict. “We’re confronting variations on Cold War challenges, but with a more sophisticated set of adversaries. Fortunately, we are in a better position to cope.”

Whelan has largely dealt with special operations forces (SOF) in regional terms as an Africa specialist throughout most of her 28 years in government service. She is expanding upon that expertise in her new role, and in preparation said she has been researching SOF writ large.

“A collateral benefit of the intense [counter-terrorism] fights in Iraq and Afghanistan is a finely tuned, hand-in-glove GEOINT-SOF relationship,” she said. “This relationship will be critical to leverage as we deal with newly emerging state-based conflicts.”

This will require synergy between both parties. Intelligence analysts and field operators must collaborate to determine how to mesh war-fighter needs with technological possibilities. It’s less a matter of “stuff and tools” than of “cooperation,” Whelan said.

“The operations side owes the intel side feedback information from what they’re doing on the ground so it can further enhance the Intel Community’s ability to refine its products,” Whelan said. “... They have to understand the dynamics of each others’ roles—the strengths, but also the limitations.”

Insatiable demands for situational awareness can only be satisfied through a coupling of both open-source and classified data to create a

“We’re confronting variations on Cold War challenges, but with a more sophisticated set of adversaries. Fortunately, we are in a better position to cope.”

— Theresa Whelan, Principal Deputy Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict

product that isn’t just data, but the story it tells.

Referencing her experience in Africa, Whelan told about U.S. support to the recent Ebola outbreak. Looking beyond the map was key to understanding a region in which borders are fluid and frequent migration across them a way of life—and sometimes death.

“When you looked at Ebola and looked at a map that showed the outbreak was really in a remote corner of Guinea,” there was a tendency to believe “it would stay in a remote corner of Guinea,” Whelan said. “But when you looked past the lines, you were able to realize it might have been in a remote corner of Guinea, but it was not in a remote corner of the region.”

That realization aided the U.S. in its efforts to marshal aid—especially geospatial tools and technologies—that helped quell the outbreak.

It’s also a lesson in a problem both the defense and intelligence communities must address: risk that stems from the ebb and flow of areas of interest. Whelan cited an emphasis on Somalia that waned, then picked up again while she was an Africa specialist.

“[This ebb and flow is] one of our greatest challenges,” she said. ■



Theresa Whelan, Principal Deputy Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict, spoke about leveraging the hand-in-glove GEOINT-SOF relationship to deal with newly emerging, state-based conflicts during her keynote Tuesday.

SHIFTING CULTURE FOR A COMPLEX WORLD

Gen. McChrystal Explains Why Decision-Making Power Should be Distributed Across Organizations

When Gen. Stanley McChrystal first took the helm of Joint Special Operations Command (JSOC), he approved every operation in Iraq—about four a month. Two years later, “We were doing 300 a month, and I was approving none of them,” McChrystal said during his keynote address Tuesday at GEOINT 2015.

McChrystal, a retired, four-star general as well as former commander of JSOC and U.S. and International Security Assistance Forces (ISAF) Afghanistan, said culture changed so much during that part of his military career that approving operations was no longer his job.

Rather, he said his job was to create an environment in which decisions could be made at lower echelons, and “to help put people and things in a mindset and position to create something that operated with the kind of synergy you have to have in today’s world.”

Speaking just after the release of his new book, *Team of Teams: New Rules of Engagement for a Complex World*, McChrystal challenged the audience to rethink decision-making policies, referencing historical examples of how the traditional hierarchy our nation has embraced for centuries doesn’t always work. Within traditional organizations, information starts at the bottom and works its way to the top, where decisions are made, and then it’s communicated back down for execution.

What McChrystal learned in Iraq was that his team—what he called an “extraordinary collection of individuals” probably better at what they do than any other organization—was a slow-moving, traditional hierarchy.

“We had to fundamentally shift our culture, processes, and approach into something much more akin to what Al Qaeda in Iraq had become: a network.”

Rather than trying to solve military challenges with an old system, McChrystal is known for shaking up the status quo—developing and implementing the current counter-insurgency strategy in Afghanistan and creating a counter-terrorism organization that changed interagency operating culture.

In his keynote, McChrystal stressed the difference between “complicated” and “complex.”

“We often use them interchangeably, and that’s a mistake,” he said.

Whereas a car is complicated, we know we can turn the key and it will do the same thing time and again. Weather pattern models, in which tiny changes in variables create completely different outcomes, are complex.

Gen. Stanley McChrystal spoke about the necessity of adaptability and rethinking organizational hierarchies during his keynote address.



The effect of these complex events, he said, cannot be predicted.

“I was trained as an engineer,” McChrystal said. “The idea that a problem has two different answers on subsequent days is disturbing, but the reality is many things in a world of complexity with the speed of interconnectedness are impossible to predict.”

Organizations designed during the Industrial Age were intended to make people and machines more efficient, but such structures and processes now limit personnel because the environment they’re operating in is vastly different.

The rise of information technology has allowed groups such as Al Qaeda and ISIS to leverage social media and other forms of communication in unprecedented ways, McChrystal said. As a result, these groups’ adaptability trumps a well-resourced, well-trained, and traditionally efficient military.

McChrystal concluded his keynote with some thoughts on leadership and how his own views have changed.

“I started to think about leaders as gardeners,” he said. “When you think about what a gardener does, a gardener doesn’t grow flowers or vegetables. A gardener creates the opportunity, shapes the ecosystem so plants have the opportunity to do what they do well. You’ve got to prepare the ground, you’ve got to do all the things that make it work, but you’re not growing anything.”

When you realize you’re a facilitator, he said, it’s a very different mindset.

“That steps you back a little from the heroic figure making all the decisions.” ■

NGA'S 'NEW POWER' CONTINUED

NGA-USGS CENTERS OF ACADEMIC EXCELLENCE

The National Geospatial-Intelligence Agency (NGA) and United States Geological Survey (USGS) named 17 universities as Centers of Academic Excellence in Geospatial Science (CAE GS) to help develop state-of-the-art geospatial science technology and tradecraft.

NGA Director Robert Cardillo announced the 17 universities and presented designation certificates Monday afternoon during the NGA/USGS Center of Academic Excellence Program concurrent session at GEOINT Foreword.

The goal of the CAE GS Program is to build, strengthen, and cultivate the current and future geospatial sciences workforce for the U.S. government. The program aims to accomplish this mission through championing academic programs that commit to excellence in geospatial sciences, emphasizing faculty development in geospatial sciences, improving the quality of geospatial science programs on a continuing basis, and ultimately providing a pipeline of students poised to become geospatial professionals.

"The [GEOINT] Community is being redefined," Cardillo said during the presentation. "'Inside the agency,' 'inside the department,' 'inside the government' aren't very useful terms anymore. For redefining [our] community and for growing [our] talent, this [program] is truly a win-win."

The 17 CAEs are:

- United States Air Force Academy
- Alabama A&M University
- University of Alabama
- Arizona State University
- Delta State University
- Fayetteville State University
- George Mason University
- Mississippi State University
- Northeastern University
- The Ohio State University
- Pennsylvania State University
- Roane State Community College
- University of Maine
- University of South Florida
- University of Texas – Dallas
- University of Utah
- United States Military Academy

according to Cardillo, who used his keynote as an opportunity to introduce four new strategic goals for his agency:

■ **PEOPLE:** NGA needs to attract, develop, and sustain a more "diverse, agile, self-aware, and expert" workforce, according to Cardillo, who promised to cut through NGA's "Gordian Knot" like Alexander the Great by creating a "learning organization with a culture of innovation" that rewards risk-taking and collaboration. Specific goals include workflow automation, which will allow analysts to spend more time analyzing; activity resolution and activity-based intelligence, which will facilitate increased GEOINT storytelling; and small satellites, data from which will empower analysts. "While I recognize that there



There was a full house in Hall C for the first day of general session keynote addresses.

are two sides to the world of growing transparency, I'm energized and enthused about this development," Cardillo said of the SmallSat revolution. "Frankly, it's pushed GEOINT to an inflection point ... The democratization of GEOINT and the darkening of the skies is the opportunity of our time."

■ **PARTNERS:** In Greek mythology, Atlas held the entire world on his shoulders. NGA is no Atlas, according to Cardillo, who said the agency will adapt to an increasingly "chaotic, messy, and dangerous" world by focusing on greater collaboration with open online communities of geographers and technologists, international partners, industry, universities, and think tanks, all of which constitute a partnership Cardillo calls "Team GEOINT." "Team GEOINT ... uses skills and collective power to advance our craft, extend capabilities, and connect with the community of practitioners," he said. "NGA cannot do it alone. NGA will not do it alone. So we must leverage the collective strength of the team."

■ **PROFESSION:** The benefit of increased partnership, according to Cardillo, is enhanced tradecraft. "We must advance excellence in our craft," he said, promising industry that he would bring increased speed, flexibility, and efficiency to NGA's acquisition process in order to accelerate GEOINT transformation. "We're breaking down the barriers to inclusion and innovation in the commercial and academic worlds ... to be as effective in the unclassified world as we were and are in the classified world."

■ **VALUE:** Its focus on people, partners, and the profession will drive NGA's final strategic goal, which is increasing its value by transitioning from a "customer-focused" to a "customer-centric" organization. "We have to understand [our customers] so well that we not only anticipate their needs, but we exceed their expectations," said Cardillo, who described NGA's role in the IC going forward as that of a "service provider and data broker" providing its customers a platform for "on-demand, all-domain access" to geospatial information.

“Frankly, it’s pushed GEOINT to an inflection point . . . The democratization of GEOINT and the darkening of the skies is the opportunity of our time.” —Robert Cardillo, Director, NGA

Behind NGA’s new strategy—which the agency test-drove during the Nepal earthquakes in spring 2015—is a revised mission statement: “We strengthen the nation through our command of geospatial intelligence.”

Having command of geospatial intelligence shouldn’t be interpreted as having a monopoly over it. Cardillo pledged that under his leadership NGA would succeed not by providing all the answers, but rather by asking all the questions. And most importantly, by being open and accessible enough to receive answers from others.

“On his 10-year odyssey back from the Trojan War, Ulysses faced a number of new threats. His old power—a large military force that was victorious in the Trojan War—was of little use. He needed a new approach to these threats,” concluded Cardillo, adding the source of NGA’s “new power” will be the collective strength of the GEOINT Community. “If we’re honest with ourselves about what we can achieve alone or together, we know we’re better off together. Because that way we’ll be strong enough to help our customers handle the heaviest burden they ever have to bear.” ■



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TRAINING SNAPSHOT

This year, the GEOINT Symposium offers 82 hours of dedicated professional development. Attendees are eligible to receive 0.2 Continuing Education Units for 29 out of the 41 courses offered, courtesy of Riverside Research, an International Association for Continuing Education and Training authorized provider and USGIF mission partner in STEM education.

WEDNESDAY AFTERNOON, the following sessions will be offered from 2 to 4 p.m.:

Advances in Geospatial Mapping Technologies to Serve Defense and Homeland Security

Room 145A

This training provides a dynamic forum to address current advances in aerial geospatial sensor technology and data processing as it relates to the geospatial intelligence and defense communities.

The World in 3D: Point Cloud Technology

Room 145B

This course illustrates the technologies used to obtain 3D point clouds and 3D measurements at high spatial resolution.

The Devil's in the Data: Commercial, Combat, and Policy Applications for Spatiotemporal Big Data

Room 147A

This interactive session outlines some of the major developments in data-driven and spatial analytics from the past 10 years, including lessons learned from Iraq and Afghanistan.

Introduction to Shortwave Infrared Analysis Tools

Room 147B

This workshop presents the core skills needed for understanding how to create real-world products from shortwave infrared spectral information, focusing on modules applied to urban mapping, wildfire mitigation, flooding, and disaster relief.

Deep Learning on GPUs: A Breakthrough in Image Classification

Room 149A

This session introduces deep learning in the broader context of machine learning and the factors driving its success as well as the key phases and considerations of developing and deploying deep learning systems on graphics processing units.

GEOINT 101

Room 149B

During this fast-paced course we will provide an overview of the function and mission of GEOINT as it is practiced today.

The Geographic Approach and Spatial Literacy Workshop

Room 304

Through interactive group discussion and example scenarios, participants gain an understanding of how spatial analyses and the geographic approach are used in many different disciplines around the world such as health, law enforcement, market analysis, natural resources, and more.



THURSDAY MORNING, the following sessions will be offered from 7 to 9 a.m.:

Understanding GeoCyber Potential

Room 145A

This session explores the geospatial methods critical to solving the long-term challenges of cyber operations as well as the unique contributions geography and geospatial methods have in cyber mission planning and operations.

A Multi-Tradecraft Approach to Educating the GEOINT Workforce

Room 145B

This session educates the analytic workforce on the GEOINT tradecraft used for defining and describing the environment, assessing threats and hazards, and developing analytic conclusions.

Usability and Accessibility Training for Web-based GEOINT Applications

Room 147A

This presentation teaches how to avoid common pitfalls in usability engineering and how you can help improve your favorite GEOINT application.

The Promise and Reality of Cognitive Computing

Room 147B

This session introduces participants to cognitive computing and encourages a discussion regarding long-term vision and future applications.

Secure Broadband IP Over Satellite

Room 149A

This program develops knowledge of global satellite networks, applications, and secure broadband IP over satellite as well as broadband for GEOINT via satellite.

Inspector Detector: Mobile Applications as Indicators of GEOINT

Room 149B

This presentation shares methods for analyzing app metadata in order to determine an app's geographic affiliation, and discusses research and methodology for analyzing mobile applications as indicators of GEOINT.

GEOINT 101

Room 304

This session will cover the full range of geospatial intelligence collection systems, analysis, and applications.

EXPLORING THE GEOINT LEXICON

A Multi-Tiered Vetting Process Would Help Define Tradecraft Language

A panel of industry, government, and academic experts discussed the GEOINT lexicon—essentially exploring the very essence of geospatial intelligence—Monday during a GEOINT Foreword concurrent session.

“[When] I think of ‘intelligence,’ you’ll see over 100 definitions,” said Shawn Kalis, director of strategy and proposal management for Applied Research Solutions. “Words mean different things even within the Department of Defense.”

The lack of a common language within the GEOINT Community affects how people communicate, proposals are funded, and contracts are fulfilled.

Among the many questions posed at the outset of the conversation: How do you define terms that are dynamic? Where to begin? How do you consider the perspectives of a warfighter, Wall Street analyst, and all users in between?

Daniela Moody, a scientist in the Intelligence and Space Research Division of Los Alamos National Laboratory, cited the community’s long and challenging process for defining activity-based intelligence (ABI) as an example—and said even the ABI definition includes the vague term ‘multi-INT.’

Diana Sinton, executive director of the University Consortium for Geographic Information Science, referenced the popularity of crowd-sourcing and suggested a Wiki format to capture input and definitions



GEOINT Analytics Lexicon panelists from left to right: Chris McLean, Los Alamos National Laboratory; Diana Sinton, UCGIS; Daniela Moody, Los Alamos National Laboratory; Shawn Kalis, Applied Research Solutions.

from various audiences. This idea was embraced and revisited throughout the session.

Kalis noted the challenge of determining who will have authority over the definitions on a page such as a Wiki.

“We don’t want it so structured that [people are] like, ‘Well, that’s NGA’s definition, we’re the Air Force,’” Kalis said.

Of course, a new lexicon resource should be digital and accessible, Sinton added.

Kalis said he’d like a one-stop shop to look up terms—such as AcronymFinder, which he uses today.

Monday’s discussion was the first in a series of planned conversations concerning the GEOINT lexicon. The conversation will continue in August at the ENVI Analytics Symposium in Boulder, Colo., hosted by Exelis.

GOLFING FOR GEOINT

101 golfers took to the course at 1757 Golf Club in Dulles, Va., Monday for the Allder Golf Classic, named in honor of William R. Allder, Jr. Teams raised \$10,000 toward USGIF educational initiatives such as the USGIF Scholarship Program, which has to date awarded \$792,000 in scholarships to students studying the geospatial sciences and related fields. Allder was a prominent figure in the GEOINT Community, serving in high-level positions at the National Geospatial-Intelligence Agency, and before that in key positions at several intelligence and civilian mapping and imagery organizations. In this photo, Bill Allder III and Soozie Allder accept the \$10,000 check on behalf of USGIF.



SMALL SATELLITES, BIG OPPORTUNITIES

Panel Predicts Bright Future for SmallSats

Sometimes, big things come in small packages. Nowhere is that more evident than with the advent of small satellites, otherwise known as SmallSats. Although each weighs less than 200 kilograms—approximately the size of a washing machine—SmallSats promise to fundamentally change the way commercial satellite imagery is collected, accessed, analyzed, and distributed, panelists agreed Monday during the “Utilizing Commercial Space and SmallSat Assets” concurrent session at GEOINT Foreword.

Led by Moderator Jessica “JB” Young, a mechanical engineer at Lockheed Martin and co-chair of USGIF’s SmallSat Working Group, the panel explored the abundant benefits of SmallSats.

“There is a burgeoning opportunity in industry where there are people thinking creatively about the use of small spacecraft,” said Richard Leshner, director of government affairs for SmallSat innovator Planet Labs. Leshner described SmallSats as a “sandbox for creativity and innovation” due to their low cost and rapid development cycle.

Inside the SmallSat “sandbox,” industry and government will play side by side, said National Geospatial-Intelligence Agency (NGA) Staff Officer Thomas Doyne.



Utilizing Commercial Space and SmallSat Assets panelists from left to right: Richard B. Leshner, Planet Labs; Chris Ruf, NASA; Thomas Doyne, NGA; Wade Larson, UrtheCast; Jessica Young, Lockheed Martin.

“We recognize the disruptive innovation that is occurring in industry and we are working to create a community process by which we ride this wave of innovation,” Doyne said.

As customers, government agencies will leverage SmallSats to achieve persistent situational awareness across a wide swathe of missions, of which one of the most essential will be weather forecasting, according to Chris Ruf, principal investigator for NASA’s Earth Venture mission.

In a Q&A with audience members, panelists acknowledged SmallSats still face many hurdles, including lower image clarity and accuracy, and a new and unknown business model. However, they concluded prospects remain strong.

“If you look at this industry, historically there have been four barriers that have impeded wide-scale adoption: cost, regulatory constraints, access, and distribution,” said Wade Larson, CEO of SmallSat company UrtheCast. “All of those barriers are starting to crumble.”



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“We recognize the disruptive innovation that is occurring in industry and we are working to create a community process by which we ride this wave of innovation.” — Thomas Doyne, NGA

7:00-9:00a

TRAINING & EDUCATION SESSIONS

- Using Geospatial Data to Generate a Common Understanding of the Environment – Tesla Government (145A)
- Neighborhood Spatial Modeling Workshop – KEYW Corp. (149A)
- OpenStreetMap: Source for Worldwide, Seamless, Crowdsourced Geospatial Feature Data – CACI (145B)
- Hand-Held Open Apertures: Methods and Technology & Hand-Held ISR-Traditions and Future– Red Hen Systems (147B)
- Commercial Electro Optical Imaging – USGIF EO Working Group (304)
- Multi-INT Fusion for Activity Recognition for Uncoordinated Sensors – Aptima (147A)

9:00-9:15a

MASTER OF CEREMONIES – ADM. THAD ALLEN, U.S. COAST GUARD (RET.), FORMER COMMANDANT, U.S. COAST GUARD (HALL C)

9:15-9:45a

KEYNOTE – ADM. MICHAEL S. ROGERS, U.S. NAVY, COMMANDER, USCYBERCOM; AND DIRECTOR, NSA/CHIEF, CSS (HALL C)

9:45-10:00a

USGIF GEOSPATIAL AWARDS PRESENTATION (HALL C)

10:00-5:00p

EXHIBIT HALL OPEN (HALLS A-B)

10:00-10:45a

A CONVERSATION WITH NGA’S SENIOR LEADERSHIP

- Robert Cardillo, Director, NGA
- Susan M. Gordon, Deputy Director, NGA
- Ed Mornston, Chief of Staff, NGA
- Misty Tullar, Director of Plans and Programs, NGA
- James Griffith, Deputy Director of Operations, NGA

10:45-11:15a

NETWORKING BREAK – SPONSORED BY KEYW (OUTSIDE HALL C)

11:15-11:45a

KEYNOTE – ROBERT D. KAPLAN, AUTHOR “THE REVENGE OF GEOGRAPHY;” SENIOR FELLOW, CNAS (HALL C)

11:45-12:30p

NATIONAL SECURITY ROUNDTABLE

Moderator: Michael E. Leiter, Former Director, NCTC; and Executive Vice President for Business Development and Strategy for Leidos

- Thomas Bush, Deputy Assistant Commissioner, Office of Intelligence, U.S. Customs and Border Protection
- Eric Velez-Villar, Executive Assistant Director, FBI Directorate of Intelligence, Federal Bureau of Investigation

12:30-2:00p

LUNCH BREAK AND EXHIBIT TIME (HALLS A-B)

1:00-2:00p

WORKING GROUP PRESENTATION – NGA & SMALL BUSINESS (305)

- Mike Geggus, Industry Innovation Advocate, NGA
- Justin Poole, Director, Xperience Directorate, NGA
- John Goolgasian, Director, Source Operations and Management Directorate, NGA
- Rich Bayard, Deputy Director, Plans & Programs, NGA

1:00-2:00p

WORKING GROUP PRESENTATION – GEOINT WILDLIFE SECURITY AND ILLICIT TRAFFICKING (303)

- Kelvin Alie, Programme Director, Wildlife Trade, International Fund for Animal Welfare
- Terry Ford, National Intelligence Manager for Africa, Office of the Director for National Intelligence
- David Luna, Senior Director, National Security and Diplomacy, Combating Global Threats and Navigating Geo-Security Risks, Office of Anti-Crime Programs, INL U.S. Department of State
- Robert Mutinda Muasya, Acting Deputy Director Security, Kenya Wildlife Service
- Catherine Semcer, Consultant, Humanitarian Operations Protecting Elephants
- Scott Stetson, Vice President, Remote Sensing Division, KEYW Corporation

1:00-4:00p

USER GROUP MEETING – LAW ENFORCEMENT/FIRST RESPONDER TRADECRAFT CHALLENGES AND OPPORTUNITIES EXCHANGE (EAST OVERLOOK)

- **1:00-2:30p** - Federal Civil

Moderators: Melissa Pacak, NGA; and Dr. Shawana P. Johnson

- Glenn Bethel, Remote Sensing Advisor and Disaster Management Imagery Liaison, USDA
- John Desmarais, Director of Operations, Civil Air Patrol
- Dr. Jerry Johnston, Geospatial Information Officer, DOI
- Robert Tetrault, South American Analyst and Global Food Security Liaison, USDA
- Candice Wright, Criminal Intelligence Section Long Beach Police Department, Long Beach FBI JTTF

- **2:30-4:00p** - Local Law Enforcement/First Responder/Industry

Moderator: Melissa Pacak, NGA

- Mark Dupont, Executive Director, NASBLA
- Jacob King, Fire Chief, Wright Patterson AFB,
- Bruce Seibert, Vice President, Airborne Collections, Law Enforcement Liaison, Assist Aviation
- Jeff Wobbleton, Statewide Interoperability Communication Coordinator, DC Metro Police

1:30-4:00p

GOVERNMENT PAVILION STAGE (HALL B, BOOTH 8105)

- **1:30-2:00p** – The Honorable Thomas M. Battle Jr., Mayor, City of Huntsville
- **2:00-2:30p** - David Alexander, Director, Geospatial Management Office, DHS
- **2:30-3:00p** – Michael Howell, ISE Deputy Program Manager; and Director, Classified Information Sharing and Safeguarding Office
- **3:00-3:30p** – Ivan B. DeLoatch, Executive Director, Federal Geographic Data Committee
- **3:30-4:00p** – “Legal and Policy Trends” by Cindy Ryan, General Counsel, NGA; and Kevin Pomfret, Executive Director, The Centre for Spatial Law and Policy

2:00-3:30p

BREAKOUT DISCUSSION – GEOINT AND EPIDEMIOLOGY: THE ROLE OF GEOSPATIAL INTELLIGENCE IN HEALTH CRISIS ANALYSIS AND MISSION (146)

- Introductory Keynote – Rear Adm. Scott F. Giberson, Commander, Commissioned Corps’ Ebola Response in West Africa; and Director, Division of Commissioned Corps Personnel and Readiness (DCCPR), Department of Health and Human Services (HHS)

Moderator: Melissa Hersh, Fellow, Truman National Security Project; and Hersh Consulting

- Justin Poole, Director, Xperience Directorate, NGA
- Capt. Michael Schmoyer, Deputy Director of Intelligence, Office of Security and Strategic Information, Department of Health and Human Services
- Rob Shankman, GIS Program Manager, U.S. Department of Health and Human Services
- Karen Walsh, CEO, Blue Glass Development

2:00-4:00p

TRAINING AND EDUCATION SESSIONS

- Introduction to Shortwave Infrared (SWIR) Analysis Tools – Exelis (147B)
- The World in 3D: Point Cloud Technology – Naval Postgraduate School (145B)
- Deep Learning on GPUs: A Breakthrough in Image Classification – NVIDIA (149A)

- Advances in Geospatial Mapping Technologies to Serve Defense and Homeland Security – Woolpert (145A)
- The Geographic Approach and Spatial Literacy – Esri (304)
- The Devil’s in the Data: Commercial, Combat, and Policy Applications for Spatiotemporal Big Data – Northrop Grumman (147A)
- GEOINT 101A: Function and Mission, USGIF and The Intelligence & Security Academy - USGIF (149B)

2:45-3:15p

AFTERNOON REFRESHMENT BREAK - SPONSORED BY BOUNDLESS (146)

4:00-5:00p

EXHIBIT HALL RECEPTION (HALLS A-B)

- Small Business Reception in the Small Business Pavilion

4:00-5:00p

YPG LOUNGE MENTORING SESSION (HALL A, BOOTH 1033)

5:30-9:00p

YPG LOUNGE NETWORKING SESSION (RFD WASHINGTON, 810 7TH ST. NW)

» **THURSDAY JUNE 25 AT-A-GLANCE**

EXHIBIT HALL OPEN 10:00-3:00P

7:00-9:00a	TRAINING & EDUCATION SESSIONS
9:00-9:15a	MASTER OF CEREMONIES — JIM SCIUTTO, CHIEF NATIONAL SECURITY CORRESPONDENT, CNN
9:15-10:00a	KEYNOTE — REP. ADAM SCHIFF, RANKING MEMBER, HOUSE PERMANENT SELECT COMMITTEE INTELLIGENCE; REP. DEVIN NUNES, CHAIRMAN, HOUSE PERMANENT SELECT COMMITTEE INTELLIGENCE (Hall C)
10:00-10:15a	USGIF’S ARTHUR C. LUNDAHL-THOMAS C. FINNIE LIFETIME ACHIEVEMENT AWARD PRESENTATION (Hall C)
10:15-11:00a	KEYNOTE – THE HONORABLE JAMES R. CLAPPER, DIRECTOR OF NATIONAL INTELLIGENCE (Hall C)
11:00-11:30a	NETWORKING BREAK – SPONSORED BY JUNIPER NETWORKS & TECHNICA (Outside Hall C)
11:30-1200p	KEYNOTE – BETTY J. SAPP, DIRECTOR, NATIONAL RECONNAISSANCE OFFICE (Hall C)
12:00-12:30p	KEYNOTE – THE HONORABLE MARCEL LETTRE, ACTING UNDER SECRETARY OF DEFENSE FOR INTELLIGENCE (Hall C)
12:30-2:00p	LUNCH BREAK AND EXHIBIT TIME (Halls A-B)
12:30-3:00p	FAMILY DAY – A VARIETY OF FAMILY ACTIVITIES AND EVENTS FOR CHILDREN TAKE PLACE THROUGHOUT THE EXHIBIT HALL (Halls A-B)
1:00-2:30p	BREAKOUT DISCUSSION – IMPROVING HUMAN GEOGRAPHY DATA FOR HUMAN SECURITY MAPPING (146)
1:00-3:00p	TRAINING AND EDUCATION SESSIONS
1:00-3:00p	GOVERNMENT PAVILION STAGE (Hall B, Booth 8105)
1:00-3:00p	SCAVENGE DASH (Halls A-B)
2:00-3:00p	EXHIBIT HALL RECEPTION & FAMILY DAY (Halls A-B)
4:05-7:30p	GEOINT 2015 CLOSING CELEBRATION: WASHINGTON NATIONALS VS. ATLANTA BRAVES, NATIONALS PARK, METRO GREEN LINE; OR 1500 SOUTH CAPITOL STREET, SE, WASHINGTON, DC 20003

Thursday, June 25

FAMILY DAY



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