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Protecting Our GEOINT Advantage

DEPUTY UNDER SECRETARY OF DEFENSE FOR INTELLIGENCE KARI BINGEN SETS
BENCHMARKS FOR PENTAGON PROGRESS

By Matt Alderton

During a keynote address at the GEOINT 2017 Symposium in San Antonio, former National Geospatial-Intelligence Agency (NGA) Director Robert Cardillo observed the 73rd anniversary of D-Day. Codenamed "Operation Overlord," the indelible mission instantly turned the tide of World War II in favor of Allied forces.

"Operation Overlord was fueled by some of the most important maps and charts and imagery intelligence in history," said Cardillo, who called D-Day a "pointed reminder of who we are and who we must be as an Intelligence Community."

Two years later—on the eve of D-Day's 75th anniversary—the Honorable Kari A. Bingen, principal deputy under secretary of defense for intelligence, shared the same sentiment during a GEOINT 2019 keynote address delivered on the same stage, in the same city.

"Much is known about the scattering of the paratroopers who assaulted Normandy," Bingen said. "What is less identifiable in this success is the amazing accuracy of what would become geospatial intelligence that was provided to them prior to the invasion. ... The precursor of GEOINT, 75 years ago today, directly enabled the success of the Allied landings in Normandy."

The Department of Defense (DoD) has the same "solemn obligation" to warfighters today that it had to warfighters then, Bingen said during her Wednesday morning keynote. "Just as the imagery intelligence provided a critical advantage to the Allies that consequential night," she continued, "so, too, does GEOINT provide us a comparable advantage today—so long as we continue to push the envelope in our design and employment of innovative GEOINT technologies."

In an enterprise as entrenched as the Pentagon, pushing the envelope is easier said than done. Still, defense intelligence professionals must set ambitious goals that advance their tradecraft toward new horizons that will make future D-Day moments possible.

Sharing those goals with the GEOINT Community was Bingen's charge on stage, where she outlined five principal objectives for the

➤ see *Advantage* p. 14



The Honorable Kari Bingen, Deputy Under Secretary of Defense for Intelligence.

"The precursor of GEOINT, 75 years ago today, directly enabled the success of the Allied landings in Normandy."

—KARI BINGEN, DEPUTY UNDER SECRETARY OF DEFENSE FOR INTELLIGENCE

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TRAJECTORY ON LOCATION

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SPEC INNOVATIONS' INNOSLATE OFFERS SIX TOOLS IN ONE

COMPANY HIGHLIGHTS LIFE CYCLE DEVELOPMENT OFFERINGS FOR SYSTEMS ENGINEERS

By Jim Hodges

When Dr. Steven Dam founded SPEC Innovations in 1993, he originally envisioned a firm with employees to train systems engineers and consult on projects.

He understood systems engineering had become "systems of systems," partly because of growing complexity that arose during the Space Age, when rockets sent capsule systems aloft to report to communications and data systems.

SPEC learned the defense and commercial sectors had processes only slightly less complex than NASA, but existing tools couldn't

keep pace with the new paradigm.

"I figured I'd need six tools, and that wouldn't be trivial, and that wouldn't be cheap," Dam said in a 2018 webinar.

As a result, the company developed Innoslate, one model-based tool to perform the work of six.

At GEOINT 2019, Innoslate implemented life cycle modeling language and had "requirements management, program management, testing management, and modeling and simulation capabilities designed to meet the needs of any system or process," said Elizabeth Steiner, SPEC's



IMAGE COURTESY OF SPEC INNOVATIONS

Spec Innovations' Innoslate systems engineering tool helps developers steadily meet requirements and goals.

director of marketing and sales.

With Innoslate, the developer establishes a requirements level and builds from the design level up. Each level refers to its predecessor to keep the mission on target and costs down. The impact a change in one system will have on another is evident, so negative

impacts can be remedied immediately, rather than later at greater expense. Surprises at the end of the product life cycle are lessened or eliminated, and forensic information offers lessons learned.

"A lot of people need a model-based engineering tool and don't even know it," Steiner said.

RAPID IMAGE PROCESSING

PIXELEMEN USES PHOTOGRAMMETRY AND COMPUTER VISION TO RECONSTRUCT THE 3D WORLD

By Kristin Quinn

PixElement develops geospatial software and data analytics that empower customers to harness the power of multi-resolution terrestrial, aerial, and satellite data and turn it into high-fidelity 3D information.

"High-fidelity 3D information is crucial to situational awareness," said Founder Ben Vander Jagt. "For example, understanding and quantifying the volume of materials being moved on a

weekly basis from Site A to Site B, or determining precise line-of-sight calculations for mission planning and threat mitigation. Analytics that may have taken hours or days to create previously are now compiled and disseminated at the click of a button."

PixElement uses photogrammetry and computer vision techniques to reconstruct the 3D world, then via its analytics platform, allows users to conduct full 3D data exploitation from the comfort of their web browser.

"Our main focus is ease of use and reducing the latency of decision-making—every 2D/3D/4D product we create can be visualized and analyzed in the browser from any device, which streamlines how information is disseminated between

different project stakeholders," Vander Jagt continued.

Additionally, PixElement only exports derivative data in open formats, which allows them to be ingested easily into existing software workflows.

Founded in 2015 in Columbus, Ohio, PixElement

has largely served commercial customers in construction, land development, and other heavy industries. Specific use cases on display at GEOINT 2019 included urban 3D modeling, 4D volume monitoring, geo-positioning, and roof measurement.

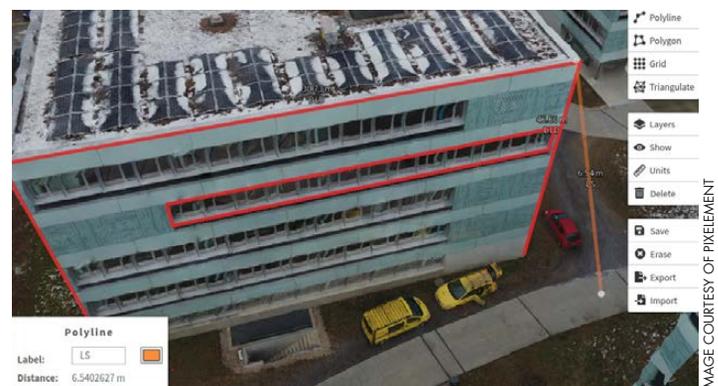


IMAGE COURTESY OF PIXELEMEN

ESTABLISHING THE AUTONOMOUS CONNECTED BATTLESPACE

HEXAGON US FEDERAL SHOWCASED SOLUTIONS FOR HARNESSING DATA FOR IMPROVED SITUATIONAL AWARENESS AND OPERATIONAL CONTROL

By Matt Langan

For the past year, **Hexagon AB** has highlighted how Autonomous Connected Ecosystems (ACE) are the answer for harnessing the flow of information and the orchestration of resources for improved situational awareness and operational control.

“Data creation is huge,” said Hexagon AB CEO Ola Rollen in June 2018. “It outpaces data use, and the Internet of Things is going to open the floodgates. In the past two years, we have produced more data than ever in the history of mankind.”

In ACE, data from the physical world is connected with that of the digital world—with an underlying thread of intelligence for advancing decision-making. Hexagon US Federal applied these ACE principles to defense at GEOINT 2019, where the company’s demonstration theme was “Establishing the Autonomous Connected Battlespace (ACB).”

With robotics, autonomous weapons, UAVs, satellite imagery, and other intelligence inputs available, there is a need to fuse data from those sources, then present it quickly in a dynamic common operating picture.

Hexagon US Federal has a growing footprint in the U.S. defense and intelligence communities, which was enhanced with Hexagon AB’s recent acquisition of Thermopylae Sciences and Technology and its data visualization solutions.

Many of Thermopylae’s solutions are built on the Google technology stack, and will be part of the ACB demonstrations. Thermopylae’s technology capabilities also work well in a disconnected battlefield environment.

In addition, Hexagon Geosystems showcased its sensors and digital reality capture solutions that are essential for ACB. The Hexagon US Federal team also highlighted Hexagon Geospatial division’s Luciad portfolio of advanced geospatial analytics and visualization solutions as well as M.App X, a cloud-deployable enterprise solution for GEOINT imagery intelligence applications.

COLLABORATIVE GEOINT

GNIS FORMS PARTNERSHIPS TO DELIVER IMPROVED GEOINT FOR THE ARCTIC AND BEYOND

By Kristin Quinn

GeoNorth Information Systems (GNIS) was a repeat exhibitor at the GEOINT Symposium, this year showcasing its Arctic persistent surveillance work with the National Geospatial-Intelligence Agency (NGA), its partnerships with Lockheed Martin and Descartes Labs, and its contract with the Army Geospatial Center (AGC).

The work GNIS is conducting with NGA is “driving capabilities for Arctic monitoring, change detection, and maintaining a dynamic foundational dataset in the Arctic,” according to Jon Heinsius, general manager and director of geospatial programs.

As a small business, Heinsius said, partnerships are essential help GNIS pursue larger programs and opportunities.

The company is partnered with Lockheed Martin through use of Lockheed’s Rosetta toolset, leveraging automation for global-scale production.

GNIS also supports AGC with timely and responsive satellite imagery acquisition and data production.

At GEOINT 2019, Heinsius said he was looking forward to “hearing what the panel discussions speak to, what current priorities are, and what the next few years look like for geospatial intelligence.”

A glacier captured by TerraSAR-X.



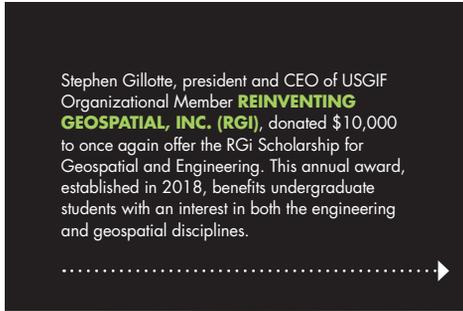
IMAGE COURTESY OF DIR.E.V. 2017, DISTRIBUTION AIRBUS DS.

Philanthropy Abounds at GEOINT 2019

In addition to GEOINT 2019 attendees raising \$5,625 via the Diplar initiative to send USGIF's Portable Planet map of North America to schools around the nation, several check presentations were made to USGIF's Board of Directors Tuesday in support of GEOINT education.

Donors presented checks to USGIF Chairman of the Board The Honorable Jeffrey K. Harris, USGIF COO Karin Fitzgerald, and USGIF VP of Programs Ronda Schrenk.

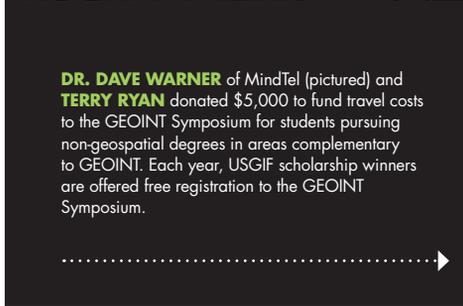
Thank you to all who contributed to USGIF's educational initiatives at GEOINT 2019 and who demonstrate generosity year-round in support of future GEOINT professionals!



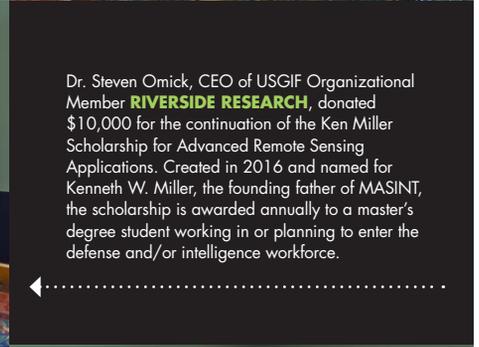
Stephen Gilotte, president and CEO of USGIF Organizational Member **REINVENTING GEOSPATIAL, INC. (RGI)**, donated \$10,000 to once again offer the RGI Scholarship for Geospatial and Engineering. This annual award, established in 2018, benefits undergraduate students with an interest in both the engineering and geospatial disciplines.



Dr. Steven Omick, CEO of USGIF Organizational Member **RIVERSIDE RESEARCH**, donated \$10,000 for the continuation of the Ken Miller Scholarship for Advanced Remote Sensing Applications. Created in 2016 and named for Kenneth W. Miller, the founding father of MASINT, the scholarship is awarded annually to a master's degree student working in or planning to enter the defense and/or intelligence workforce.



DR. DAVE WARNER of MindTel (pictured) and **TERRY RYAN** donated \$5,000 to fund travel costs to the GEOINT Symposium for students pursuing non-geospatial degrees in areas complementary to GEOINT. Each year, USGIF scholarship winners are offered free registration to the GEOINT Symposium.



Advanced Cloud Computing and Analytic Services

GEOINT SYMPOSIUM CLASSIFIED DAY SPONSOR QUADRINT SUPPORTS NGA MODERNIZATION AND MUCH MORE

By Kristin Quinn

Quadrant has supported the National Geospatial-Intelligence Agency (NGA) with cloud modernization, data analytics, and more for nearly 20 years.

One major initiative Quadrant contributed to significantly was the migration of NGA applications from data centers to Amazon C2S.

"We moved 20 full application stacks out of data centers and to the cloud, and in the process helped NGA define its approach to accrediting applications," said Managing Principal Glenn Merberg.

Today, Quadrant offers advanced C2S consulting and is promoting cloud modernization across the greater Intelligence Community. In April, the company was awarded a GSA IT Schedule 70 Cloud Special Item Number (SIN) to include cloud-related IT professional services such as assessing, preparing, refactoring, migrating, integrating, and developing new native cloud applications.

In addition to cloud computing, Quadrant has built out

"enterprise-scale, multi-fabric analytics capabilities" for NGA, Merberg continued. "We are architecting the data analytics environments in such a way that it supports AI and machine learning, so as the agency pushes further in that direction the structure is in place to support the adoption of these newer tools and approaches."

Quadrant is the sponsor for USGIF's GEOINT 2019 classified session to be held June 13 at

NGA Campus East in Springfield, Va., and will have strong representation at the event, just as it did at GEOINT 2019 in San Antonio.

"NGA is our biggest customer," Merberg said. "We look forward to seeing where the community is going and meeting with colleagues to learn about the latest priorities and technology."



Lt. Michael P. Murphy Award Presented to Air Force Capt. Katherine Meckler

MECKLER RECOGNIZED FOR HER SERVICE AS AN ELECTRONIC WARFARE OFFICER WHO RELIES ON GEOINT FOR MISSION SUCCESS

Director of the U.S. Army Geospatial Center Gary W. Blohm (right) along with Ronda Schrenk, vice president of programs at USGIF (left), presented the 2019 Lt. Michael P. Murphy Award in Geospatial Intelligence to Capt. Katherine Meckler of the U.S. Air Force.



Tuesday afternoon at GEOINT 2019, the 2019 Lt. Michael P. Murphy Award in Geospatial Intelligence was awarded to Capt. Katherine Meckler of the U.S. Air Force.

Meckler is from Mechanicsburg, Penn., and completed her undergraduate degree at Penn State, where she also received an Air Force commission through the U.S. ROTC program. She is currently pursuing a master's degree in geographic information systems at Penn State while stationed at Naval Air Station Pensacola, where she serves as an Electronic Warfare Officer with more than 1,300 flight hours on the RC-135U COMBAT SENT.

"Until I began studying GEOINT with Penn State, I did not realize just how essential it was to

nearly every stage of my mission," Meckler said. "I rely on GEOINT for mission planning, pre-mission briefs, mission execution, and post-mission analysis to provide situational awareness, operational expertise, and context to my collected strategic electronic reconnaissance information. Without GEOINT, I would be left to execute the mission in the blind, and my collected information would be meaningless to the warfighters. GEOINT achieves for my mission what every other 'INT' cannot—it provides a powerful frame of reference with which to easily digest complex life-or-death ones and zeros."

The award was presented to Meckler by Director of the U.S. Army Geospatial Center Gary W. Blohm and Ronda Schrenk, vice

president of programs at USGIF.

The Murphy Award is named for Navy SEAL Lt. Michael P. Murphy, a distinguished Penn State alumnus. Murphy was killed June 28, 2005, by enemy forces during a reconnaissance mission in Afghanistan. For his selfless leadership and courageous actions, he was posthumously awarded the Medal of Honor. The Murphy Award recognizes achievement by a Penn State graduate who is serving or has served in the U.S. Armed Forces or Intelligence Community. Recipients are chosen based upon demonstration of exceptional contributions to the GEOINT discipline.

The generosity of USGIF, Maxar, and faculty, staff, and friends of Penn State contributed to endowing the Murphy Award. 🌐

"Until I began studying GEOINT with Penn State, I did not realize just how essential it was to nearly every stage of my mission."

— CAPT. KATHERINE MECKLER

Government Pavilion Stage Highlights

PRESENTERS DISCUSS NGA PARTNERSHIPS, MARITIME DOMAIN AWARENESS, AND MORE NRO PERSPECTIVES ON COMMERCIAL IMAGERY



NGA leaders Jennifer Daniel, Associate Director for Enterprise (left), and Maj. Gen. Charlie Cleveland, Associate Director for Operations (center), spoke on a panel moderated by Lewis Shepherd, Vice Chair, AFCEA Intelligence Committee (right).

Government leaders shared insights and business opportunities Tuesday afternoon at the Government Pavilion Stage in the GEOINT 2019 exhibit hall, sponsored by AT&T.

NGA LEADERS ON SHIFTING MISSIONS AND THE IMPORTANCE OF PARTNERSHIPS

BY ROB PEGORARO

Changing missions at the National Geospatial-Intelligence Agency (NGA) doesn't mean abandoned priorities or waning partnerships, according to two agency leaders.

Jennifer Daniels, associate director for enterprise, and Maj. Gen. Charles Cleveland, associate director for operations, gave a discussion on, "Operations & Interoperability: Fueling the GEOINT Enterprise."

Cleveland noted how NGA's work has shifted. On the military side, it's pivoting from counter-terrorism back to "great-power competition," on the civilian

side, its products have become increasingly vital in areas such as humanitarian assistance.

But, Daniels added, support for the warfighter still comes first. "Lives are on the line; people do what they need to do," she said.

Cleveland added that work remains to be done to ensure NGA insights help all those customers: "We have got to be able to reach all the way out to that person at the DMZ or sitting in Afghanistan."

America's allies must remain among those customers, Daniels said after nearly all phones in the audience blared simultaneously with flash-flood warnings—a fortuitous reminder of the importance of timely intel. "We start with Five Eyes, we don't start with NOFORN," she said.

Later, she answered a question about whether NGA would start charging allies and partners for shared imagery with one word: "No."

Their talk wrapped up with two reminders regarding the value of unclassified information. Cleveland admitted he didn't know if NGA had an unclassified report on China's Belt and Road Initiative but said the agency would fix that if necessary to ensure its insights get "the widest dissemination."

And Daniels answered a question about incorporating publicly-available data into classified NGA reports with a common refrain: "I want all of the information," she said. "I don't care where it comes from."

SECURING THE SEA

BY MATT ALDERTON

Panelists Tuesday afternoon sounded the alarm on the importance of maritime domain awareness, which the International Maritime Organization (IMO) defines as "the effective understanding of anything associated with the maritime domain that could impact security, safety, the economy, or the marine environment."

As for the maritime domain itself: The National Strategy for Maritime Security said it encompasses "all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway, including all maritime-related activities,

infrastructure, people, cargo, and vessels and other conveyances."

"With that definition, not only does [maritime domain awareness] include the 71 percent of the Earth's surface covered by water, but it also includes all the adjacent land," said panel moderator Nicole Pilkus, NGA's deputy director for maritime safety. "Given that, the importance of this topic cannot be overstated."

That became abundantly clear during the subsequent discussion, titled "Collaboration in Space for International Global Maritime Awareness." The two panelists—Guy Thomas, science advisor to the multinational Maritime Security Center of Excellence, and Piotr Malinowski, head of the European Border and Coast Guard Agency's Information Fusion Centre—took turns describing the scale of maritime security challenges around the world. They advocated for what they consider the only practical solution: a global maritime awareness system under which multiple nations will collaborate to finance and deploy shared space-borne assets that can be tasked toward maritime problems such as piracy, illegal fishing, smuggling, terrorism, and migration.

"[Maritime domain awareness] is not a national security problem; it is an international security



Nicole Pilkus, Deputy Director of Maritime, NGA (right), moderated a discussion with Piotr Malinowski, Head of Information Fusion Centre, European Border and Coast Guard Agency (left), and Guy Thomas, Science Advisor to the Multinational Maritime Security Center of Excellence (center).



Peter Muend, Director, Commercial Systems Program Office, NRO

of the current and future capabilities of commercial electro-optical (EO) imagery providers.” Across the GEOINT Community, heads turned and ears perked. Intrigued, commercial imagery providers wanted to know more.

Those with questions received answers Tuesday at the GEOINT Symposium, where Peter Muend, director of NRO’s Commercial Systems Program Office, gave a talk titled, “NRO and Commercial Systems for GEOINT.”

During the presentation, Muend took the audience on a tour of NRO’s new commercial imagery acquisition strategy, which stems from the recent transition of commercial imagery acquisition responsibilities within the Intelligence Community to NRO from NGA. Though the latter has passed the buck in terms of procurement, it continues to write requirements for acquired imagery. And the requirements leave no doubt: To satiate its growing appetite

for satellite imagery, the IC must take advantage of every available resource—including commercial.

Against that backdrop, NRO issued the aforementioned RFI, the results of which it revealed at the GEOINT Symposium, where Troy Meink, leader of NRO’s Geospatial Intelligence Directorate, announced that NRO had awarded three commercial imagery study contracts to BlackSky Global, Maxar Technologies, and Planet. As Muend subsequently outlined on Tuesday, those contracts will help NRO assess the companies’ capabilities and could give way in as little as six months to full-blown procurement contracts.

During a combination of prepared remarks and audience Q&A, Muend walked prospective industry partners through long-term plans. His principal message, however, was as simple: “Where it makes sense to acquire commercial imagery, we will buy it.” 🌐

problem,” declared Thomas, who said advances in commercial satellites and connectivity have finally made a global system feasible—if only nations could invest the time, effort, and resources needed to seek and find common ground (or water, as it were). “Technology is the easy part. It’s how you make everybody work together and solve this problem that’s the tough part. But it’s well worth the effort and we need to press on.”

PROCURING THE FUTURE

BY MATT ALDERTON

The National Reconnaissance Office (NRO) isn’t exactly known for open doors. So, when it puts out a welcome mat, people notice.

That’s what happened in January, when the agency issued—on Twitter and Facebook, no less—a request for information (RFI) seeking “a greater understanding

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GEOINT's Future is "St. Louis-Made"

ST. LOUIS MAYOR LYDA KREWSON ON WHY HER CITY IS THE NATION'S BURGEONING CENTER FOR GEOSPATIAL EXCELLENCE

By Lisbeth Perez

During a keynote address at GEOINT 2019 Wednesday morning, St. Louis Mayor Lyda Krewson expressed her excitement and aspirations for the future of GEOINT in St. Louis.

"I'm proud to say that St. Louis is the nation's center for geospatial excellence," Krewson declared.

In June 2016, the National Geospatial-Intelligence Agency (NGA), in collaboration with the U.S. Army Corps of Engineers and the U.S. Air Force, decided to invest \$1.7 billion to build the Next NGA West (N2W) campus in North St. Louis. The new headquarters will be located just North of the gateway arch, a monument that commemorates the famous expedition of Lewis & Clark.

"Since [2016] we have worked to prepare the site for NGA's new home," Krewson said. "27 city blocks were cleared. Over 60,000 archeological artifacts uncovered. 830,000 tons of dirt was removed and over 30,000 cubic yards of streets were removed."

The 97-acre N2W campus—scheduled to be completed by 2025—will include an office building of approximately 712,000 square feet, an inspection facility, access control points, a visitor's center, and parking garages.

Krewson noted that NGA has been a part of the St. Louis community for approximately 70 years. In 1952, the St. Louis Arsenal, where the NGA West Campus currently resides, went from manufacturing and supplying small arms to becoming the U.S. Air Force's Aeronautical Chart and Information Center.

"We are so excited to continue our partnership with NGA and help them meet their mission for



Lyda Krewson, mayor of St. Louis, Mo., spoke at her first GEOINT Symposium Wednesday morning.

our country and the century," Krewson said.

As part of its mission, NGA will collaborate with the private sector, geospatial startups, and neighborhoods in and around the future N2W location. The agency also plans on collaborating with neighborhood schools and surrounding universities to train and educate its next generation of employees.

Krewson pointed to remarks made by NGA Director Vice Adm. Robert Sharp in April during the inaugural Geo-Resolution conference at Saint Louis University: "I couldn't be more excited about what we're doing in St. Louis and it starts with people and with partnerships," Sharp said. "We are also committed to those people and partnerships. We are all working together for the future."

Krewson also noted the value of the area's regional and state governments, civic organizations,

"We see a very bright future in St. Louis with geospatial technology leading the way." — ST. LOUIS MAYOR LYDA KREWSON

academic institutions, economic development groups, and businesses that are all collaborating to create a thriving geospatial ecosystem.

"Our ecosystem of mission-driven geospatial partners, innovators, entrepreneurs, investors, thinkers, and doers make St. Louis the place where you can put yourself on the map," Krewson said. "We see a very bright future in St. Louis with geospatial technology leading the way."

The GEOINT Symposium will be held in St. Louis for the first time in 2023, and again in 2025. 🌐

Teamwork and a Talent Pipeline are Key to NSA's Future

USCYBERCOM EXECUTIVE DIRECTOR SPEAKS AT GEOINT 2019

By Rob Pegoraro



David Lubber, Executive Director, United States Cyber Command, spoke Wednesday morning.

“Let’s face it, we are in an era of great power competition.”

— DAVID LUBBER, UNITED STATES CYBER COMMAND

The government’s cybersecurity challenges demand teamwork and a strong workforce pipeline.

David Lubber, executive director of United States Cyber Command, centered his keynote Wednesday morning at GEOINT 2019 around that recruitment message.

“Let’s face it, we are in an era of great power competition,” he said, name-checking Russia and China as well as Iran and North Korea.

“We all know that there have been governments that have been out stealing intellectual property,” he said. “We know they’ve been stealing personally identifiable information and even using proxies to conduct malign influence

in our government and against even our electoral processes.”

“Collectively, these activities are corrosive,” Lubber said. “That’s something we all need to work together on, as a whole-of-government effort.”

Lubber cited the work of the National Security Agency (NSA) and the rest of the Intelligence Community (IC) to help protect the midterm elections from foreign interference.

“That was absolutely critical work as we focused on those actors that wished to use malign influence against the U.S. and our democratic process,” he said. “It took a team from Cyber Com-

mand, it took a team from NSA, and it took a lot of coordination, working closely with DHS, working closely with FBI, and working closely with the rest of the U.S. government to ensure that we could counter those threats.”

He suggested that the IC in general still needs to “work together on some of our data standards, data tagging opportunities, and then even down to the lowest level possible where we can identify classification of data”—so intelligence products can be disseminated at the lowest classification possible.

“When you think about our warfighters and many of our tactical users out there, they’re not necessarily sitting there with a top-secret terminal ready to

receive our intelligence,” Lubber observed.

After saying that the IC’s first competitive advantage is its people, Lubber also discussed NSA’s attempts to build a talent pipeline.

“We’re reaching out to even the K-through-the-12 schools in programs like GenCyber, focusing on STEM development,” he said, and cited an example from two years ago.

“We had one of the local Denver schools participating in GenCyber,” Lubber said. “And it was about 30 14-year-old students who were engaged in STEM work, writing Python programs, working with robotics—all the things you might imagine you might do in a STEM camp, a summer camp for students—but they were also speaking Mandarin Chinese the whole time.”

Right there, he suggested, you can see the “multi-disciplined language analyst of the future.” NSA’s outreach to students also includes a work-study program for high schoolers and 300 university partnerships.

Lubber’s message of collaboration and cooperation also extends to private industry. He pointed attendees to DreamPort, a new facility in Columbia, Md., “where we bring in companies to focus on new, innovative cyber defensive capabilities.”

But even companies not looking to get NSA’s business have work to do. Noting the steady stream of security patches to combat new forms of malware, Lubber offered a useful reminder: “Keeping those systems patched is absolutely critical.” 🌐

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Coalition Climate Means Partners Must Be Part of AI, Machine Learning Movement

ALLIED COMMANDERS DON'T WANT TO BE LEFT BEHIND

By Jim Hodges

The United States does not go to war in a vacuum, so neither should it transition to artificial intelligence (AI) and machine learning technology without coalition partners, according to speakers in a panel discussion Wednesday at GEOINT 2019.

“We don’t fight wars alone anymore,” said RADM (Ret.) Rosanne M. LeVitre, assistant director of national intelligence for IC-DOD coordination/integration with the Office of the Director of National Intelligence, during a session titled, “NATO and Coalition Support to the Warfighter.”

On behalf of NATO, Matt Roper added, “We have to be able to adopt AI, but without leaving anybody behind.”

Roper’s reference was to the infrastructure needed to implement emerging technologies. NATO faces the challenge of varying resources among its 29 members, each of whom have different levels of funding with which to update those resources.

While NATO recently adopted a roadmap to AI, “there is no current clear strategy or policy or platform,” to follow it said Roper,

“We have to be able to adopt AI, but without leaving anybody behind.”

— MATT ROPER, NATO



Dr. L. Roger Mason, Jr., USGIF Board of Directors (left), moderated a discussion with Rosanne M. LeVitre, RADM Retired, USN, Assistant Director of National Intelligence for IC-DOD Coordination/Integration, ODNI (center), and Matt Roper, Chief of Joint Intelligence, Surveillance Reconnaissance Services, NATO Communications and Information Agency.

a former UK combat pilot who is now chief of joint ISR Services with the NATO Communications and Information Agency.

LeVitre, an intelligence professional during her Naval career, said she prepped for her remarks by speaking with coalition officers about their thoughts on the new technology paradigm.

“Their feedback ... was that we all start together,” she said. “Allied commanders don’t want to be left behind. They want to do their best from the beginning in the push toward AI use.”

Some NATO nations already have their own statements with principles concerning AI and machine learning, defining their

defense parameters concerning the technology. Officials from those nations encourage allies to follow suit, according to Roper.

LeVitre added that her sources’ feedback included a statement that AI and machine learning must have “long-haul”—“their term, not mine,” she said—application and require support from “senior-level, tenured” champions.

Roper agreed. “This is a journey we’re in for the long game,” he said.

Key is “building trust” both in the technology and each other, LeVitre said.

Roper shared a historical reference about trust in technology.

In its infancy, he said, AI had

an algorithm that “demonstrated that a verifiable image of a panda was actually assessed to be a penguin after the original image was modified with only a 0.03 percent variation in pixel quality.”

“While that may not be important, unless you’re a panda or a penguin, if you transpose that to a military context, you have some serious challenges,” Roper said.

LeVitre said, NATO recognizes the hurdles inherent in modern technology adoption, but must overcome them to continue to fight as a coalition.

“We have to establish a short path toward adopting [AI],” Roper said. “We have to create a sandbox where we can come together.”

Advantage *continued from cover*



Kari Bingen

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“It is an exciting time to be in GEOINT. This Symposium is a testament to that. ... Never has the government had so many diverse options available to it for GEOINT infrastructure, data, services, and applications.”

— KARI BINGEN, DEPUTY UNDER SECRETARY OF DEFENSE FOR INTELLIGENCE

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defense intelligence enterprise.

Goal No. 1, Bingen said, is to “move up the data ‘value chain,’ beyond raw pixels and bulk image buys, to services and applications that add value, knowledge, and insights.”

Doing so will require increased acceptance and integration of commercial capabilities.

“While NGA has vast GEOINT data stores, the commercial sector also has sizable commercial imagery libraries that are growing at an exponential rate,” Bingen continued. “With all of this unclassified data readily available, we are seeing an influx of new thinking, spurring new companies and business areas to achieve incredible innovation. They’re applying machine learning, advanced analytics, computer visualization, and offering new data products. We in government need to take advantage of the tremendous investment the private sector has made in this area.”

Goal No. 2, Bingen said, is fielding artificial intelligence (AI) and machine learning (ML),

a real, operational capability to the field applying AI/ML to [UAV] full-motion video. Since then, the team has significantly expanded the capability—in scale and scope—expanding the number of geographic locations, number of platforms and data, and intelligence mission areas beyond video.”

Maven has delivered not only capabilities, but also lessons learned.

“What has been most significant is what we’ve learned about the ‘AI pipeline,’” reflected Bingen, who said Maven has been a classroom in which to develop scalable best practices in areas such as data accessibility, preparation, and labeling, not to mention algorithm verification, validation, and management. “Maven is now fielded in enough places that we’re hitting critical mass, and the next true measure of success will be to see actual changes in our analytical workflows.”

Those workflows complement goal No. 3: changing the tasking, processing, exploitation, and

progress, which is evident in the evolution of Project Maven, established in 2017 by Lt. Gen. John N.T. “Jack” Shanahan, director of defense intelligence for warfighter support with the Office of the Under Secretary of Defense for Intelligence.

“I am pleased to report that in under two years, Maven has made steady progress as a pathfinder for AI/ML,” Bingen announced. “Most importantly, in under six months from the Authority to Proceed in June 2017, they delivered

dissemination (TPED) model for GEOINT.

“We need to focus on the ‘ground,’ which has long played second fiddle to collection platforms,” said Bingen, emphasizing the need for domestic and international data sharing and interoperability. “We need a new, more dynamic, integrated model for TPED if we are to keep pace with the changing threat.”

Also needed are enhanced security and diverse talent—goals No. 4 and 5, respectively.

Of security, Bingen said it “is no longer optional, but a necessity” and called on industry to do a better job protecting trade secrets from foes such as China. “What’s in R&D now—what’s being stolen now—is what we’ll face on the battlefield in five to 10 years,” she explained. “And when we no longer have that technical advantage, our military advantage ... erodes.”

Of talent, she said, “Our defense intelligence mission demands a diverse workforce. After all, our job is to understand others: other countries, their cultures, geographies, capabilities, and ways of thinking. So, diversity in backgrounds, ethnicity, gender, and in other areas across our ranks and in our thinking is vitally important to our mission success.”

The defense intelligence enterprise faces great challenges; but also, Bingen concluded, great opportunities.

“It is an exciting time to be in GEOINT. This Symposium is a testament to that. ... Never has the government had so many diverse options available to it for GEOINT infrastructure, data, services, and applications,” she said. “We are at a true inflection point. We need to tackle our big data challenge; modernize our manual, labor-intensive processes; and better posture for intel in a contested environment.” 🌐

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