

THE GEOINT 2016 SYMPOSIUM

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# SHOWDAILY

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## Embracing Commercial Space

NRO DIRECTOR BETTY SAPP TALKS COMMERCIAL LAUNCH, SMALL SATS, AND NEW CONTRACTING METHODS

By Warren Ferster

The National Reconnaissance Office (NRO) is taking full advantage of emerging commercial space and information technology capabilities including launch, NRO Director Betty Sapp declared in a Wednesday keynote at GEOINT 2016.

NRO already has contracted for launches from SpaceX, Sapp said, but did not provide any details of the missions since much of NRO's work is classified. Founded by celebrity entrepreneur Elon Musk, SpaceX recently broke United Launch Alliance's (ULA) longtime monopoly on the U.S. national security launch business by winning a contract to launch an Air Force GPS satellite. ULA, a Boeing-Lockheed Martin joint venture, declined to bid on that contract.

Sapp praised SpaceX for having success with what she characterized as an "unconventional" approach to satellite launch. SpaceX's workhorse Falcon 9

rocket has a first stage powered by nine relatively small engines, a design scheme that raised skepticism before the rocket ran off a string of successful missions.

"We have bought launches from SpaceX—they're a great partner for us," Sapp said, adding the company has "challenged the conventional wisdom in the launch industry with great success."

Launch is just one of the areas in which NRO is leveraging commercial investment and innovation. The agency is also taking advantage of the small satellite revolution, which coupled with the emergence of low-cost launch options is enabling missions NRO previously would not undertake, Sapp said.

The NRO is known for building large, unique, and very complex and expensive satellites to carry out its missions. But Sapp said the agency is now flying satellites of all sizes, including cube sats. Although the NRO initially used cube sats as a low-cost means of testing promising technologies

see Embracing p. 10



National Reconnaissance Office Director Betty Sapp discussed NRO's embrace of commercial technology, driven in part by a mission that has changed and expanded significantly since the Cold War.

**"We have bought launches from SpaceX—  
they're a great partner for us."**

—BETTY SAPP, DIRECTOR, NRO

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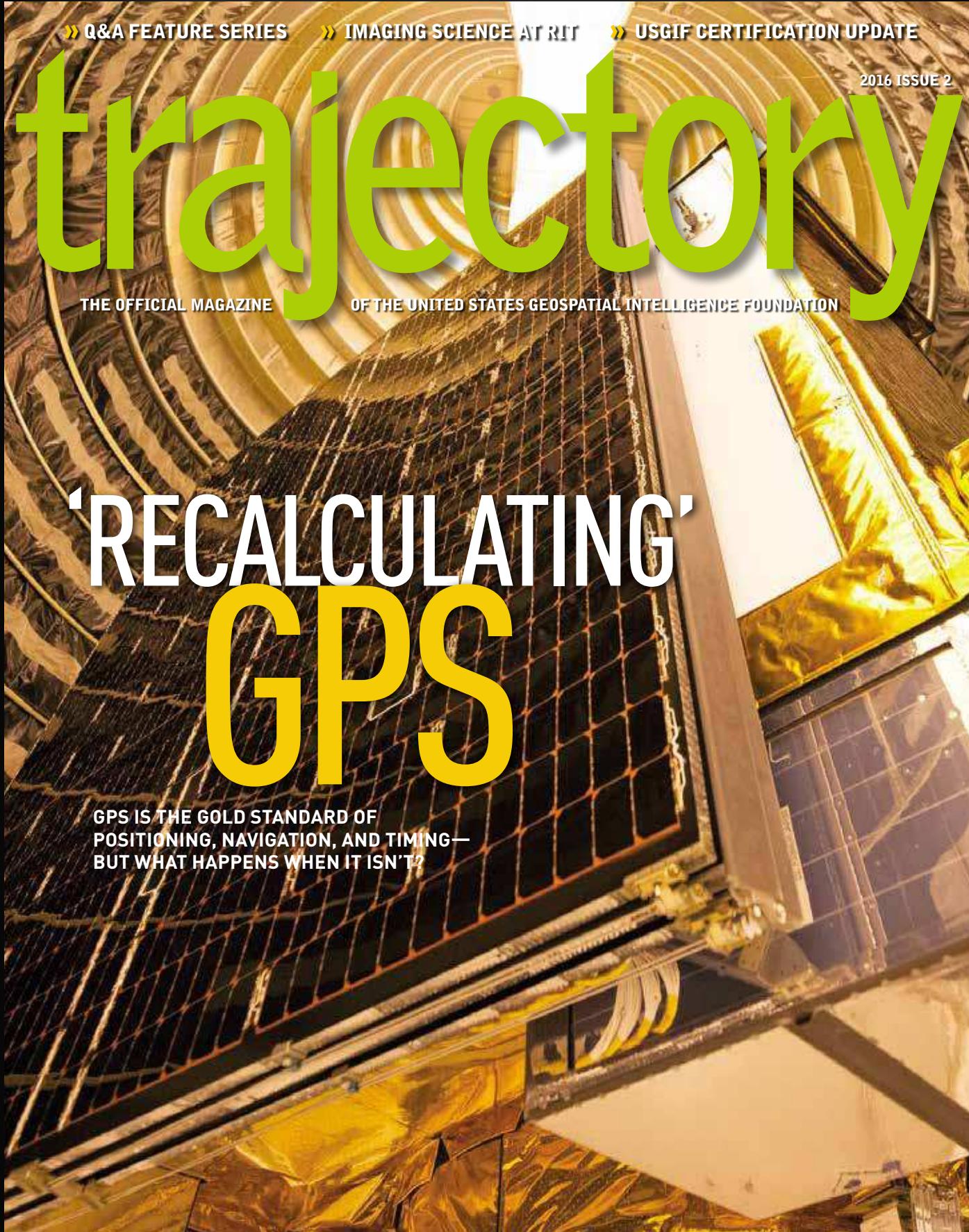
# trajectory

THE OFFICIAL MAGAZINE

OF THE UNITED STATES GEOSPATIAL INTELLIGENCE FOUNDATION

## 'RECALCULATING' GPS

GPS IS THE GOLD STANDARD OF POSITIONING, NAVIGATION, AND TIMING—BUT WHAT HAPPENS WHEN IT ISN'T?



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TASC, an Engility company, opened Wednesday's Government Pavilion session by announcing the winner of its IGAPP Grand Challenge 2016. Optensity, along with partners PlanetRisk and Rosoka, received a \$25,000 award for its SafeTravelerglobe app. Now available for download via NGA's app store, the app provides situational awareness to government employees traveling in high-risk areas. NGA Director Robert Cardillo presented the award.

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# FROM THE FLOOR

## EXHIBIT HALL HIGHLIGHTS

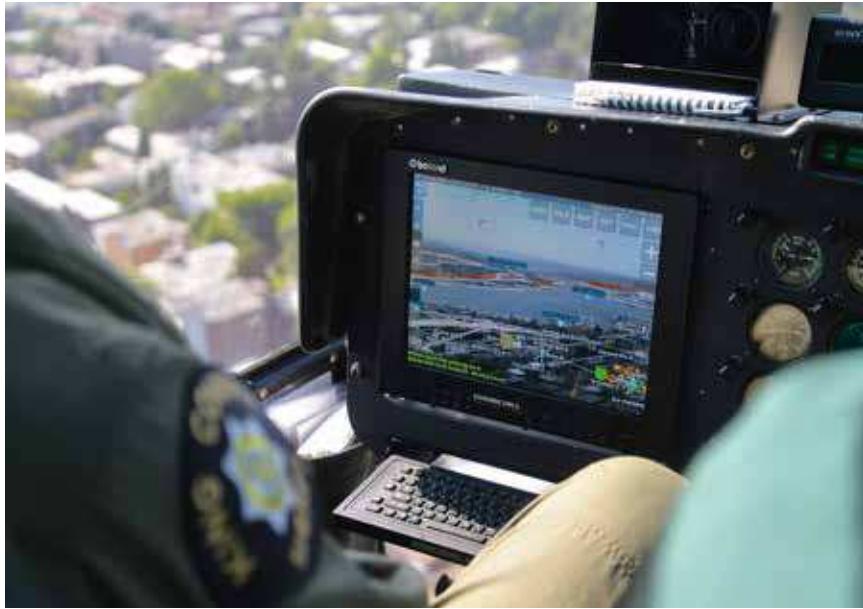


IMAGE COURTESY OF CHURCHILL NAVIGATION

Churchill's augmented reality system overlays geospatial information with real time aerial video for law enforcement and military customers.

## BOLSTERING LAW ENFORCEMENT

### CHURCHILL'S ARS OVERLAYS GIS INFORMATION WITH AIRBORNE VIDEO

**C**hurchill Navigation's, primary product, the Augmented Reality System (ARS), helps law enforcement and military personnel make quick sense of unfamiliar terrain.

The ARS, which the company displayed at GEOINT 2016, overlays GIS information with live airborne video in real time. The added information includes street names, addresses, businesses, and other data relevant to the mission at hand.

Consisting of an electronic box including a display screen about the size of a toaster oven, ARS is installed in more 300 fixed- and rotor-wing aircraft operated by organizations including federal and local law enforcement agencies, according to Erin Murphy, director of sales at Churchill.

"The system is used for surveillance, law enforcement, border security, search and rescue, aerial firefighting, utility monitoring, and military operations," Murphy said.

ARS-equipped aircraft are leveling the playing field by giving authorities a way to seamlessly transfer vital data across jurisdictions. This has enabled air crews tracking suspects in unfamiliar terrain to quickly identify and geo-locate streets and other landmarks. This information then allows ground units to seal off selected areas and close in on the suspects.

Murphy said the system also provides a synthetic view of a given area that enables air crews to gather intelligence and plan operations when the actual view is less than ideal.

## NEED FOR SPEED

### MICRON TECHNOLOGY: FAST COMPUTING DRIVES FAST DECISION-MAKING

The ability to make fast and effective decisions can be the difference between mission success and failure. Today, effective decision-making often depends on powerful, agile computing, according to Micron Technology, which during GEOINT 2016 demonstrated advances in computer processing critical to customers across the Intelligence Community.

A global leader in semiconductor and memory technology, including high-performance DRAM, flash, SSDs, and multichip packages, Micron showcased products and solutions that could deliver numerous benefits to the GEOINT Community, including rapid image classification, predictive analytics, and high-performance computing.

"We are excited about the opportunity to demonstrate the role that Micron's advanced memory and storage solutions play in accelerating complex decision-making," said Mark Hur, a director in Micron's Advanced Computing Solutions Group. "We trust Micron's innovative technology and expertise will enable advancements by the GEOINT Community in their access to and use of data."

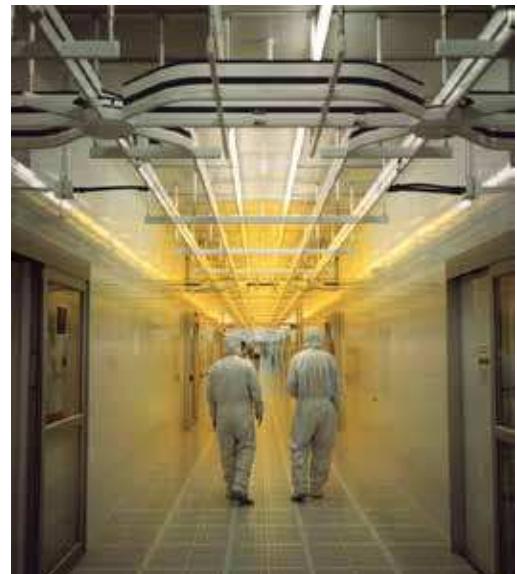


PHOTO COURTESY OF MICRON

Micron manufactures its semiconductors at Fab 6, its flagship manufacturing facility in Manassas, Va.

# FROM THE FLOOR

## EXHIBIT HALL HIGHLIGHTS

IMAGE COURTESY OF CRUNCHY DATA



Crunchy Data helps organizations trust and securely use open-source data.

### MANAGING OPEN-SOURCE DATA

#### CRUNCHY DATA HELPS ORGANIZATIONS BETTER TRUST AND APPLY OPEN-SOURCE DATA

For data to be valuable, it has to be trustable. And Crunchy Data considers itself at the forefront of a sea change, according to CEO Bob Laurence. That continuum of change is moving from legacy, licensed software and managed data to new, open-source alternatives, he said.

The four-year-old company began by working with the federal government, which was "most interested in the cost-effectiveness of the open-source model, but also had security concerns about data managing," Laurence said.

They've taken their model—which is PostgreSQL—to the healthcare sector as well, which likewise prioritizes data trustworthiness and security, Laurence said.

"We are finding very broad acceptance to the model that we created."

The company's model includes solutions that are "100 percent open-source," said VP of Marketing Dan Juengst. At its GEOINT 2016 booth, the company showcased its Crunchy Certified PostgreSQL, which includes the world's only MLS security solution for postgres. It also includes PostGIS extensions, which enable geospatial work, Juengst added.

### GEOSPATIAL TREND ANALYSIS

#### THE RECENTLY FORMED CSRA OFFERS SOCIAL MEDIA MONITORING AND ANALYTICS

One of the newest companies to attend this year's GEOINT Symposium, CSRA, formed on November 30, 2015 as a combined company when Computer Sciences Corporation spinoff CSCGov merged with SRA International.

The new company includes more than 19,000 employees, 45 alliance partners and more than 2,000 projects in the areas of defense, intelligence, healthcare, and homeland security. They also do work for civil agencies such as the Food and Drug Administration and the Environmental Protection Agency.

CSRA showcased Cross Guard, its geospatial trends analytics tool, in its GEOINT 2016 booth. Cross Guard continuously monitors social media data feeds from Twitter, Reddit, Facebook, and other platforms to deliver real-time information to help customers achieve desired mission outcomes.

### LINKING AND VISUALIZING CRITICAL DATA

#### ALTAMIRA SHOWCASED GEOSPATIAL DATA ANALYTICS AND VISUALIZATION CAPABILITIES

Altamira Technologies Corp., a provider of engineering, analytic, and software solutions to the national security community, showcased several products at GEOINT 2016, including its Lumify geospatial data fusion and visualization platform.

Lumify enables users to discover and analyze connections between data in both 2D and

3D environments, according to Andrew Mezzullo, the company's director of marketing and communications. The software, designed to run on cloud-based architectures, can integrate a variety of data to perform tasks such as extracting names from text and faces from photographs. It can also link people, places and things with documents, imagery and video.

Another product Altamira

featured in its booth was cdsBOOST, which facilitates the movement of data across networks at multiple classification levels. The product works with various Cross Domain Solutions (CDS) and makes them quicker and easier to use, easing the operating burdens of security measures.

"Our Lumify product enables GEOINT analysts to effectively visualize critical geospatial data,

while our cdsBOOST software helps analysts working within CDS systems to be more effective and efficient in making mission-critical decisions," Mezzullo said.

Altamira also demonstrated its geospatial service capabilities, including the ability to rapidly create solutions in response to emerging requirements in its research and development lab.

# Investments and Acquisitions

GEOINT 2016 PANELS DISCUSS M&A, VENTURE CAPITAL

By Melanie D.G. Kaplan and Warren Ferster



Panelists discussed the intersection of GEOINT and the Capital Markets presented Tuesday afternoon.

**O**utsiders tend to view the acquisition of a startup as the moment of arrival and validation that all entrepreneurs crave, but the reality is more complicated.

If buyer and startup do not share a common vision or goal, they might not be the best fit, according to participants in a panel on mergers and acquisitions hosted by USGIF's Young Professionals Working Group Monday at GEOINT 2016.

"You never know [ahead of time] if it's the right decision," said Shay Har-Noy, co-founder of Tomnod, which was acquired in 2013 by DigitalGlobe. Har-Noy is now vice president and general manager, platform, at DigitalGlobe.

Being absorbed into a larger company with a different culture can be risky, Har-Noy said. But if it appears that being acquired allows you to continue "doing what you love and building something where nothing stood before it's probably a good step," he continued.

For John Fenwick, one of the founders of Skybox Imaging, now called Terra Bella, the decision to be acquired by Google was a logical next step. "When we pitched Skybox, our tagline was 'we want to catalog the Earth in the same way that Google catalogs the internet,'" he said. "And here we were with the opportunity to go do just that."

Before being acquired, Skybox had raised about \$100 million in venture capital—a number Fenwick said represents a threshold beyond which investors typically look for a return before getting in deeper. Google reportedly paid \$500 million for the budding company.

Omar Balkissoon, chief executive and co-founder of OGSystems, participated in the panel from a buyer's perspective. In 2015, OGSystems purchased Urban Robotics, a provider of airborne ISR data applications and hardware. In weighing a potential acquisition, OGSystems starts with small steps, first partnering with a company in some activity

to see if cultures mesh before entertaining a closer relationship.

Har-Noy characterized this early stage of corporate courtship as "flirting."

The wide-ranging discussion touched on a number of topics, including GEOINT industry trends, where all agreed data analytics is where the action is.

"In our mind it's not about the data—we've got more data than we know what to do with," Balkissoon said. "It's how to make smart decisions and smart analytics out of all of that data. So those are the companies that we're looking at [acquiring]."

## THE VC PERSPECTIVE

A Tuesday panel discussion on the GEOINT 2016 Government Pavilion Stage focused more specifically on venture capital investment.

In an ideal world, said Brooke Coburn, managing director of The Carlyle Group, "We'd show up, buy [a business practice], sell it five years later and triple our money. At one point that was possible."

These days, he said, it's a different story. "I hope we get back to a global economy growing at faster rates than it is today, but it's not obvious what the catalyst will be."

The panel, titled The Intersection of GEOINT and the Capital Markets, explored current trends and challenges such as those faced when a company aims to succeed in both the commercial and federal arenas.

"We make a living buying companies that tried to do both and failed," Coburn said.

In some cases, a product could easily be successful for one set of customers but a failure with the other. Coburn said Carlyle's strategy is to meet one set of needs very well. He said management—especially one aware of its blind spots—is the most important thing Carlyle studies when considering an investment.

From an acquisition perspective, Leidos' Matt Vaughan said the company looks to acquire companies that have overinvested in the back office.

"I've seen it work really well when companies put a great accounting system in," said Vaughan, adding Leidos reviews about a dozen deals a week. "So when we get into a deal we can understand what we're buying."

Despite interest rates near zero, BlackArch Partners' Peter Bilden said things are looking up for venture capital investment, partly because there's now what he calls, "firm footing" in the Defense Department budget—growing at a rate of 1 to 3 percent as opposed to recent uncertainty.

"At this point in 2016, we're already matching the highest year we've had in a decade," Bilden said. 

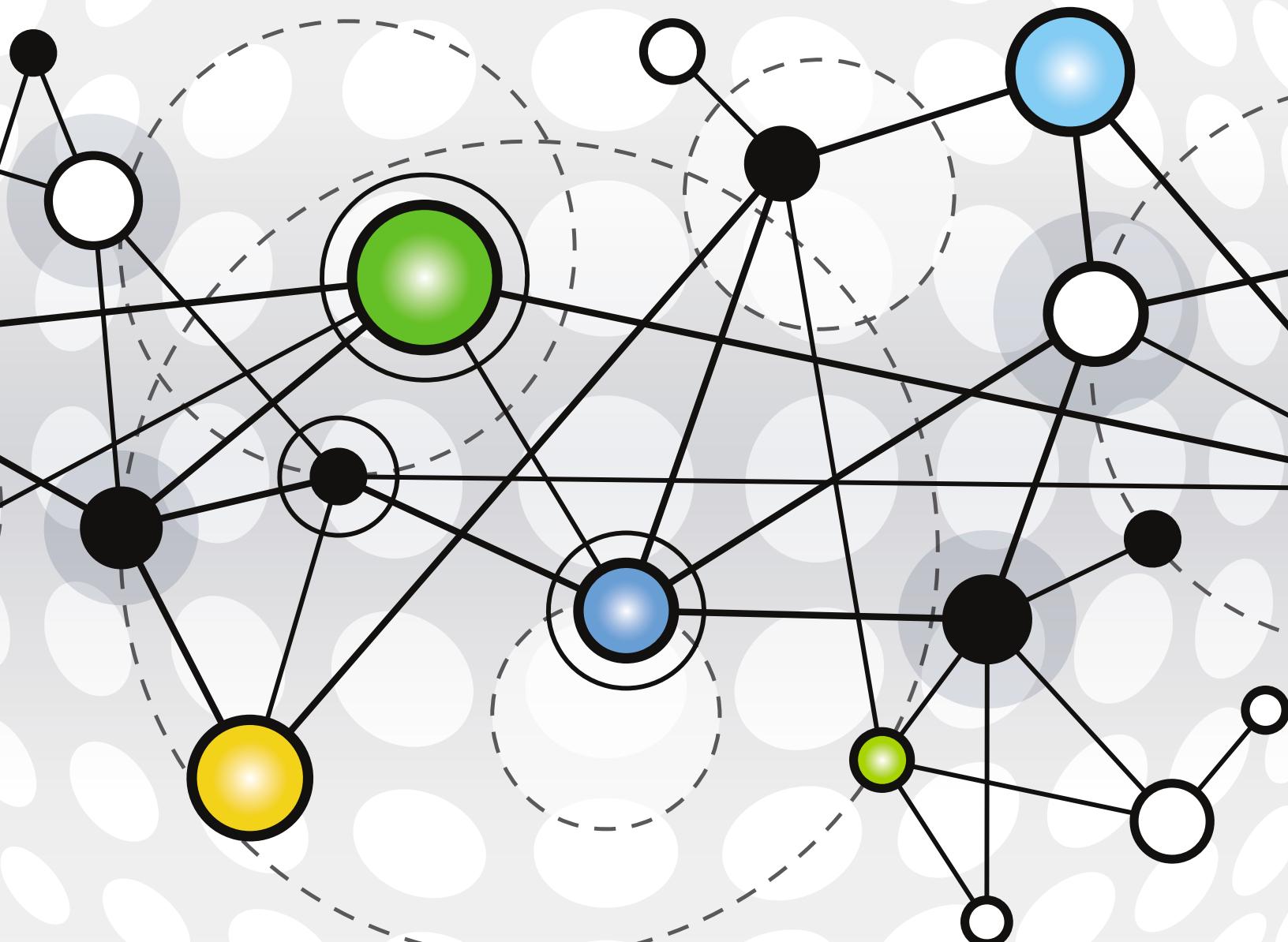


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# Breaking ISIL's Brand

THE STATE DEPARTMENT HAS A NEW WEAPON AGAINST EXTREMISM: MARKETING  
By Matt Alderton



The Honorable Michael D. Lumpkin of the State Department spoke with Jim Sciutto, CNN's chief national security correspondent, Wednesday morning.

**"We're focused on coordinating, synchronizing, and integrating the whole of the U.S. government's messaging efforts through third parties and partners."**

—THE HONORABLE MICHAEL D. LUMPKIN, DIRECTOR, GLOBAL ENGAGEMENT CENTER, STATE DEPARTMENT

**T**he Honorable Michael D. Lumpkin is no stranger to the battlefield. A former Navy SEAL, he spent more than 20 years in active-duty military service, encompassing the first Gulf War and multiple deployments in Iraq and Afghanistan. Those conflicts, however, are far different from the war he's currently fighting: Instead of parachuting from helicopters to fight enemies in the desert, Lumpkin is opening an internet browser to fight them on the web as director of the State Department's new Global Engagement Center (GEC).

Established in January, GEC's mission is to counter the sophisticated marketing and communication campaigns of violent extremist groups such as ISIL, also known as ISIS or Daesh. By creating and distributing alternative messaging, the State Department hopes the U.S. can curb the spread of violence and terror in the Middle East and around the world.

“Daesh/ISIL/ISIS has leveraged social media ... in order to

get their message out and to recruit. Basically, they've crowdsourced terrorism,” Lumpkin told Jim Sciutto, CNN's chief national security correspondent, Wednesday during a fireside chat-style interview at GEOINT 2016. “We have changed our strategy to create an agile and innovative organization to combat and to focus on countering their messages and revealing their true nature. Essentially, our

focus is looking at how we're going to break the brand of ISIL.”

Advertising and marketing executives have written volumes on how to build a brand. Breaking one, however, is less charted territory.

“[In the last year, Daesh has recruited] somewhere in the ballpark of about 20,000 folks,” continued Lumpkin. “We have to focus on how we're going to [reach] those vulnerable people who are susceptible to their message and create alternatives for them.”

Lumpkin described several strategies he believes will help his organization achieve its goals. Perhaps the most promising strategy is to distribute counter-extremism messages through third parties.

“The U.S. may have a great message, but we're not always the most credible deliverer of that message,” he explained. “So we're focused on coordinating, synchronizing, and integrating the whole of the U.S. government's messaging efforts through third parties and partners.”

Nation-state partners are critical—the U.S.' counter-ISIL

coalition has 66 members around the world—but often have competing priorities and questionable credibility amongst their citizenry. GEC's best partners, therefore, are those at the community level—including non-governmental organizations, as well as former ISIL members who have defected and the friends and relatives of ISIL recruits who have been shamed or otherwise harmed by their loved one's extremism.

[Former Speaker of the House] Tip O'Neill said, ‘All politics is local.’ All messaging is local, as well,” Lumpkin continued. “Because whether somebody has grievances or a challenge that they're trying to overcome, it's based on where they're located—their physical place.”

Also critical to getting its counter-ISIL message out is GEC's operating structure. To succeed against a media-savvy organization such as ISIL, Lumpkin insisted, GEC must be as quick and nimble as possible.

“When I got to the [office that preceded] GEC, our analytic shop was a contractor with a three-year-old Mac with two gigabytes of memory,” recalled Lumpkin, who has since reorganized the organization to look and act like a tech startup.

Which leads to GEC's biggest challenge—and opportunity—in its fight against ISIL.

“We're using a 19th century bureaucracy and 20th century tools against a 21st century adversary,” Lumpkin concluded. “So while I appreciate bureaucracy ... we also have to have the ability to build agility and innovation into it [so we can] change on a dime. Because the only thing constant in this world is change, and we have to embrace it as a government.”

# Joint PED Panel Discusses Challenges

**AWASH IN DATA, JOINT SERVICES TALK ABOUT NEW APPROACHES FOR PED AND ASK INDUSTRY TO HELP IMPROVE EFFICIENCY**

*By Melanie D.G. Kaplan*

The Department of Defense is facing a major disconnect between the volume of data collection and its ability to provide meaningful intelligence from that collection, said 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. "More data does not equal more intelligence," he said. "We're not prepared."

Sitting on panel to discuss joint processing, exploitation, and dissemination (PED) Wednesday at GEOINT 2016, Shanahan said the rapidly expanding persistent demand for intelligence, surveillance, and reconnaissance (ISR), has resulted in "an explosion of growth in ground, overhead, and

cyber platforms." He said in an age when every person and platform is a sensor, the military is overwhelmed with data to the point that the processing, exploitation, and dissemination of it has become a limiting factor. "It'll only get worse," he warned.

The panelists discussed the importance of U.S. services working together in an increasingly data-heavy world to improve operational effectiveness. Intelligence interoperability is critical to provide the most effective support, whether it's locating high-value targets or determining where to land helicopters.

Shanahan said willing collaboration between branches is fairly new and asked the audience to take note of seeing all the services

Military representatives discuss PED challenges Wednesday in a general session panel.



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**"What can you develop from a technology perspective that allows us to achieve the same effects with fewer people?"**

—LT. GEN. ROBERT P. "BOB" OTTO, U.S. AIR FORCE

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represented together on stage for this discussion. "Five years ago, you wouldn't have had this," he said.

Among the goals for collaborative PED success, panelists said, is finding best practices and allowing for flexibility in missions. They also discussed moving toward open architectures and agile methodologies.

"When we came together initially with the Army, the question was how can we do this in a way that will best meet warfighter needs, and can we back each other up," said Lt. Gen. Robert P. "Bob" Otto, the U.S. Air Force's deputy chief of staff for ISR. "How can we agree on common data standards and tradecraft and also promote analytic innovation and tool interoperability?"

The panelists discussed technological challenges—in some cases, not having enough technology, and in other cases, not being able to integrate that which already exists. A recurring topic of concern was collection management.

B. Lynn Wright, deputy director of Naval Intelligence, said intelligence officers need to let machines do their jobs in terms of data processing.

"[Officers] love to handle each bit of data," she said. "The reality is that they need to get past that... [and start] focusing on the really

hard problem set that humans can deal with."

Wright said one of her chief concerns is that she provides enough capability and automation to allow warfighters to execute their mission.

"It's an extraordinarily difficult environment and it's been a very difficult environment in last 15 years," she said.

Otto asked the audience whether they would wait seven years for a new iPhone.

"When we do block releases to modernize the [Distributed Common Ground System], it was taking us up to seven years to do that," he said. "We realized it just was not going to keep pace with innovation, technological developments, and the needs of the airmen."

He called on the commercial sector to help harness technology to reduce manpower requirements, adding the Air Force is moving "in years instead of weeks."

"Our airmen are extremely stressed," he said toward the end of the panel. "I'm concerned about the long term impact of that. What can you develop from a technology perspective that allows us to achieve the same effects with fewer people?" The nation, he said, "is asking more of the Air Force than we have people to do it." 



in space, it is now using them for operational missions, Sapp said.

"Some missions still require 'big bird' type systems," she said. "But others demand a very different approach. Some missions, for example, drive small, distributed systems flying low...Yes, the NRO does small."

Meanwhile, the NRO has established a joint office with the National Geospatial-Intelligence Agency (NGA) in an effort to determine how to best leverage the next generation commercial remote sensing industry that is employing low-cost satellites

**"We're proud of those systems and heritage—we're not defined by them."**

—BETTY SAPP, DIRECTOR, NRO

and advances in data processing capabilities.

"The new office is still in its infancy and we're still developing many of the details," Sapp said. "But it is a great opportunity for us to take a holistic approach to be sure we're taking maximum advantage of everything out there available to us."

Commercial practices and capabilities have found their way into nearly every aspect of the NRO mission, Sapp said. Whereas previously the NRO custom-built unique ground systems for each individual mission, the agency has shifted to a horizontally integrated ground architecture for all of its missions. This infrastructure heavily leverages a commercial IT industry that today is a primary engine of innovation in data processing, storage, and encryption, she continued.

"Commercial IT has caught up," Sapp said. "They can support most of what I need, and today's mission imperative demands that I do architecture integration and not individual system optimization."

NRO's current ground architecture integrates its varied space capabilities to maximize the ability to solve hard intelligence problems. This includes moving at "machine speed" to not just react to events but to anticipate them, she said.

And while NRO still builds large, unique satellites to fulfill certain critical requirements, it is increasingly taking advantage of commercially available hardware, including platforms—or buses—and sensors for some missions, Sapp said.

NRO's embrace of commercial technology is driven in part by a mission that has changed and expanded significantly since the Cold War. When the primary adversary was the Soviet Union, the sensors deployed by NRO

were designed to monitor large, slow-moving objects like strategic missiles, tank divisions, and fixed-site radars. Today, NRO must address a much wider variety of threats while at the same time providing support to warfighters at the tactical level.

"We're proud of those systems and heritage—we're not defined by them," Sapp said, referring to some of NRO's now-declassified programs of the Cold War era. "A lot has changed since then in targets, in threats, and in the opportunities available to us in the commercial marketplace."

Throughout its 55-year history, NRO has operated on technology's cutting edge. To stay there, it has a robust research and development program including the Director's Innovation Initiative, which reaches out to a broad swath of industry to bring new ideas and technologies into the intelligence-gathering game.

NRO is also trying new and nontraditional acquisition approaches including its Prospector broad agency announcement program, which was introduced on Facebook and Twitter, Sapp said. Prospector proposals were limited to a one-page abstract—typical proposals can be as thick as phone books—and a seven-minute video. Five of the seven award awards went to new NRO partners, Sapp said.

Like its mission partners in the Air Force, NRO faces a growing number of threats to its on-orbit satellites, including kinetic and directed energy, primarily from near-peer adversaries such as Russia and China, Sapp said. The agency is taking steps to make its constellations more resilient, although Sapp said this requirement is not driving NRO's embrace of small satellites. Small satellites can be targeted just as easily as the big ones, she said.

# Government Pavilion Stage

LEADERS FROM AGC, NGA SHARE INSIGHTS; LAWYERS TALK GEOSPATIAL LAW AND POLICY  
By Matt Alderton and Kristine Crane

**L**eaders from the U.S. Army Geospatial Center (AGC) and the National Geospatial Intelligence Agency (NGA) gave presentations Tuesday and Wednesday at the Government Pavilion Stage in the GEOINT 2016 exhibit hall. A group of lawyers also discussed concerns surrounding geospatial law and policy.

## MAPPING FOR ARMY MISSIONS

Most people don't realize the organization responsible for mapping the Wild West is still performing the same task all over the globe.

"The [U.S.] Army Corps of Engineers (USACE) is as old as the Army itself," said Dr. Joseph Fontanella, director of the U.S. Army Geospatial Center (AGC),

which falls under the auspices of USACE. "We've been doing this since the founding of the nation."

And for a long time, AGC worked in relatively predictable territory.

"For years, we were an Army in Europe and South Korea. We were operating in an area that was very well mapped, and we planned and executed at two scales," Fontanella explained.

That changed dramatically in the early 2000s, when in Iraq and Afghanistan the U.S. found itself in a counterinsurgency environment it hadn't seen since the Vietnam War.

"We needed a means to acquire, produce, and disseminate data useful in those types of environments," Fontanella said.

Within six years, AGC had mapped all the urban areas in Iraq, and by 2015, two-thirds of Afghanistan "at high-resolution fidelity," he added.

That's important for several reasons—one being the "need to have a more perfect knowledge of battle space than ever before," he said. This is especially true with the imminent reality of megacities, in which it will be essential to know the environment extremely well should conflicts arise.

Apart from combat missions, mapping is a tool for establishing governance in a democratizing country, for strategic operations, and even for locating water sources.

"Everything starts with a map," Fontanella said. "If you want to introduce a democratic government, you have to know where the people live. When you can map their country you can show them how to manage infrastructure and deliver emergency services."

## NGA EMBRACES AGILE ACQUISITION

NGA Deputy Director Sue Gordon heard a lot of chatter at this year's Symposium. The word she heard most, however, was "acquisition," she told the audience Wednesday at the GEOINT 2016 Government Pavilion.

"Acquisition is clearly the 'it' topic of the day. I don't think there was a single panelist or keynote speaker that wasn't asked about it," observed Gordon, who led an hour-long panel on NGA's acquisition efforts along with Industry Innovation Advocate Mike Geggus; Component Acquisition Executive Karyn Hayes-Ryan; and Senior Procurement Executive Nicole Pierce.

During their presentation, the NGA leaders highlighted programs such as GSM 2.0, a new and improved version of its GEOINT Solutions Marketplace (GSM) that's being managed by USCIF; the Innovative GEOINT App Provider Program (IGAPP), which is responsible for NGA's app store; and the Commercial Initiative Buying Operationally Responsive GEOINT (CIBORG) program, launching next year to establish new mechanisms for the procurement of imagery and imagery-derived products and services.

They also discussed efforts to make the request for proposals process more streamlined and transparent—for example, by communicating NGA's needs more clearly up front, reducing paperwork, and requiring all program managers, engineers, and source selection staff to undergo agile acquisition training.

The group also expressed NGA's commitment to continuous improvement, which was evident

NGA Deputy Director Sue Gordon discussed acquisition processes at the Government Pavilion Stage Wednesday afternoon.



Representatives from NGA, USGIF, and industry discussed GEOINT Solutions Marketplace 2.0 at the Government Pavilion Stage Tuesday afternoon.



throughout the discussion when audience members—at Gordon’s request—held up colored cards: green for good, yellow for OK, and red for bad, to grade NGA’s performance on various aspects of the acquisition process.

“Last year we handed out a report card. You generously graded us a C-,” Gordon said. “We didn’t see ourselves as doing that good ... So, get your cards out.”

### IN PRAISE OF PORTFOLIO MANAGEMENT

Is it possible to deliver more value to your customers with fewer resources? NGA has met this goal, according to senior leaders who spoke Tuesday from the Government Pavilion. How? Portfolio management.

By leveraging portfolio management structures and methodologies for the past two-and-a-half years, the agency has made “excellent progress” toward optimizing resources, improving customer service, and eliminating waste, according to NGA Director of Plans and Programs Misty Tullar.

“Our journey began in September 2013, when then-NGA Director [Letitia] Long made the decision to go to a portfolio management construct,” recalled Tullar, who said NGA leadership recognized a gap between the objectives Long had outlined in her NGA strategy

and the internal plumbing that was in place to help NGA staff achieve them. “We recognized that we needed to streamline our processes and our decision-making forums.”

John Goolgasian, who manages NGA’s content portfolio, discussed the agency’s evolving definition of “success.”

“In the past we’ve really looked at cost and schedule,” he said. “... This year we’ve done that, of course, but we’re also looking at: Are they delivering capabilities ... our analysts and officers need?”

Programs that aren’t delivering value are being terminated and their funds reallocated within and across portfolios.

“None of these portfolios work independently of each other,” concluded Gary Dunow, who heads NGA’s analytic capabilities portfolio, adding portfolio management’s greatest strength is its emphasis on the holistic enterprise instead of the stove-piped business unit.

“We all have dependencies on each other, and we all have to be successful in order for the [other portfolio managers] ... to be successful.”

### ENABLING ACQUISITION SOLUTIONS WITH GSM 2.0

Government acquisition is notoriously complex, cumbersome, and slow. In order to streamline processes—and deliver to its ana-

lysts more and better capabilities, faster—NGA has partnered with USGIF to integrate its GEOINT Solutions Marketplace (GSM) with USGIF’s Industry Solutions Marketplace (ISM). Now known as GSM 2.0, the resulting combination was the subject of a panel discussion Tuesday in the Government Pavilion.

Led by David Cacner, director of NGA’s Enterprise Innovation Office, the panel highlighted new opportunities for industry and academia, who in GSM 2.0 will find a one-stop shop for providing proposed solutions to tradecraft-focused problems.

The process is simple: Potential partners with ideas for technical capabilities can submit proposals to NGA through GSM 2.0. Upon receipt, technical engineers will review the proposals and, if necessary, work with those who submit them to refine for NGA’s unique needs and architecture. Mature proposals end up in front of staff from each of NGA’s portfolios who will then decide which proposals they want to pursue.

“Our concept is that capabilities brought in through [GSM 2.0] can be put out to the user between 30 days and nine months,” Cacner said.

Unique to GSM 2.0 is USGIF’s role: Although NGA is leveraging the community for its missions, USGIF owns GSM 2.0, ensuring maximum participation, flexibility, and accountability.

“The big difference with GSM 2.0 is there’s a social contract now between whomever posts a focused need and those that are able to provide a full or partial solution,” explained Dr. Darryl Murdock, USGIF’s vice president of professional development. “You’ll actually get feedback ... That’s huge.”

### LAWYERS DISCUSS CYBER CHALLENGES

Cyber vulnerability is a well-known problem. The Office of Personal

Management security breach in 2015—in which the identities of more than 20 million U.S. employees were stolen—brought that message home.

“Regardless of the government’s desire to acknowledge it or not, it’s out there. It affects everybody,” said Dorothy Becker, an attorney with the National Reconnaissance Office. Becker, together with Robert Strauss, an attorney from Raytheon, spoke at the Government Pavilion Tuesday.

Increasingly, attorneys will be called in to defend the government as it adapts to free and open-source software (FOSS). Moderator Kevin Pomfret, who leads USGIF’s Geospatial and Remote Sensing Law Working Group, said he hopes lawyers will become a regular part of the GEOINT Community.

Strauss said he found the Symposium and the issues concerning geospatial law and policy “fascinating.”

“Lawyers tend to get a little myopic,” Strauss said. “This makes us think outside the box and see the big picture.”

Becker told the audience, “We haven’t figured out the questions, much less the answers. We will work with you because we want those answers just as much as you do.”

“It has taken the government a long time to get on board [with FOSS],” Becker continued. “Many of the federal acquisitions accept and encourage the use of open-source software. They need to have OSS licenses reviewed. There may be clauses that the government cannot agree to.”

One of the main legal challenges concerning open-source software is it has no single ownership, Becker explained. Because many different people contribute to code from disparate environments “there is no accountability for what code contains; nor quality control,” she said. 

# The Utility of Small Sats

USGIF'S SMALL SATELLITE WORKING GROUP HOSTS GEOINT 2016 PANEL DISCUSSIONS

*By Kristine Crane and Warren Ferster*

Dave Gauthier, director of the National Geospatial-Intelligence Agency's (NGA) Office of Strategic Operations, posed this question during a Tuesday morning panel at GEOINT 2016: "Which is harder to avoid, a swarm of bees or a bear?"

With some savvy and self-awareness, a bear can be avoided—but bees?

"It's not actually that easy to avoid a swarm of bees," Gauthier said, explaining the growing relevance of small satellites in the GEOINT world is comparable to the constant surveillance of bees.

"As we are looking at closing gaps and addressing adversaries' capabilities to hide from us, it will be hard to avoid us," Gauthier said.

Small satellites, also known as small sats, are at the heart of developing better methods for monitoring world events, concluded the panel, which was hosted by USGIF's Small Satellite Working Group and addressed the expanding role of small sats for intelligence purposes.

"Can we provide better disaster relief efforts? Can we help contain the spread of Ebola? Can we actually improve the safety of the high seas?" Gauthier said. "We are already looking at global scale models of change. We can look at global issues and bring more data."

Many small sat developments are taking place outside the U.S. government. Joe Thurgood, vice president of corporate development and marketing at Hera Systems, a Silicon Valley startup, said he believes NGA's mission to connect with industry is authentic.

When NGA Director Robert Cardillo proclaimed in his Monday keynote, "We want to work with you," Thurgood said, "We feel that

we were being addressed directly. But it's going to take some time."

Google's Terra Bella, formerly Skybox Imaging, is also making inroads with its small sat constellation. Dr. Andy Hock, Terra Bella product manager, said the company is "at the beginning of analytics." For example, they can track supply changes in the Port of Long Beach, the second busiest container port in the U.S. Terra Bella can also capture high-definition video from natural disasters, such as the 2014 eruption of Mount Ontake in Japan.

"The information can give first responders a visual of area from above, which they can use to help plan search and rescue operations," Hock said.

He added the government and other satellite imagery end users are driving commercial technology.

Thurgood echoed that opinion. "This is a much better time to be a startup trying to do business with the U.S. government," he said. "We're looking forward to very active dialogue."

## SMALL SATS + OPEN SOURCE

A second Tuesday panel hosted by the Small Satellite Working Group focused on small sats and open-source analytics.

While some of the small sat ventures that have cropped up in recent years might view U.S. government business as a nice add-on that is not essential to their success, Gary Dunow, director of analysis and analytic capabilities portfolio manager at NGA, feels otherwise.

"I don't think we can allow this industry to survive strictly on commercial applications," Dunow said. "It's too important to the



Dr. Joe Thurgood, Hera Systems, sat on the first of two Small Satellite Working Group panels Tuesday.

national security mission to take that risk."

Dunow added the next generation commercial remote sensing industry presents a great opportunity for the Intelligence Community to advance its craft.

While small sats are less "exquisite" than national technical means (NTM), Dunow said it is "narrow-minded" to rely exclusively on classified NTM systems when in many cases lower-resolution imagery from smaller commercial satellites make the cut. Leveraging small sats, he said, could free up NTM systems to focus more on problems that require such high-end capabilities.

Robbie Schingler, co-founder and chief strategy officer at Planet Labs, took Dunow's remarks as vindication of his company's approach, which entails deploying medium-resolution satellites in large numbers and using advanced data analytics to turn the resulting imagery into useful information for business decisions.

"I think that really reflects the inflection point of where we're at in the small sat industry," Schingler said. Whereas small sats previously

were derided as "not very operationally useful," the industry is currently receiving a different message from NGA, he said.

The sheer number of small sats being deployed, which translate into high revisit rates that facilitate change detection and rapid decision-making, is working in the industry's favor. So too is the ability to combine small sat imagery with open-source data such as social media. Open-source intelligence can help corroborate what analysts are able to discern from satellite imagery, regardless of its resolution.

"I think we all agree that imagery from space is just one fraction of a number of tools in a decision-maker's toolbox," said John Fenwick, head of Terra Bella operations at Google.

The power of crowdsourcing, combined with new analytic tools such as artificial intelligence "allows us to improve the overall quality of the analysis that we provide to customers," Fenwick said. "Instead of just aggregating data, now we are able to come up with better answers for decision-makers."



1. A GEOINT 2016 student assistant shares his poster presentation with a Symposium attendee.

2. GEOINT 2016 attendees meet a Florida alligator at the Sunday evening Welcome Reception.

3. Virtual reality in the GEOINT 2016 exhibit hall.

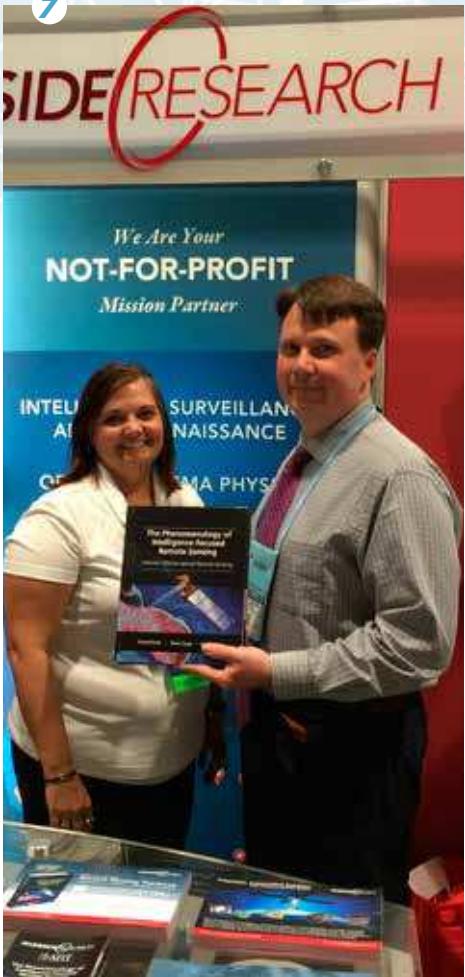
4. Government Pavilion attendees hold up green, yellow, and red cards to rate NGA's performance at the request of NGA Deputy Director Sue Gordon.

5. USGIF Chairman of the Board the Honorable Jeffrey K. Harris presents Jeff "Skunk" Baxter, a longtime friend of the Foundation and the defense intelligence community, with a Lifetime USGIF Individual Membership.

6. A costumed stilt-walker at the GEOINT 2016 Welcome Reception.



## » PHOTO GALLERY



7. Stephanie LaPlant of Riverside Research (left) presents a copy of *The Phenomenology of Intelligence-focused Remote Sensing* textbook to Richard Gardner of Geospatial Solutions, one of several winners of a free copy of the book. Textbook proceeds help fund USGIF's new remote sensing scholarship.

8. Members of the Amazing Women of the Intelligence Community networking and mentoring group pose for a photo.

9. NGA Director Robert Cardillo with participants in the GEOINT 2016 Young Professionals Golden Ticket Program.

10,11,12. Networking and demos in the GEOINT 2016 exhibit hall.



United States Geospatial Intelligence Foundation

Build the Community | Advance the Tradecraft | Accelerate Innovation

# DON'T MISS THESE EVENTS

JULY 12

**GEOINTeraction  
Tuesday**

Northern Virginia

SEPTEMBER 13

**GEOINTeraction  
Tuesday**

Northern Virginia

NOVEMBER 8

**GEOINTeraction  
Tuesday**

Northern Virginia

NOVEMBER 14-18

**GEOINT  
Community Week**

Northern Virginia

JUNE 4-7

**GEOINT 2017  
Symposium**

San Antonio, TX