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Innovating and Recruiting for DoD Readiness

DoD'S STEPHEN WELBY TALKS NEW TECHNOLOGY AND INNOVATIVE APPROACHES FOR ATTRACTING TALENT

By *Melanie D.G. Kaplan*

If you've walked the halls of the Pentagon lately, you may have noticed some individuals you wouldn't traditionally picture as Defense Department employees.

"We've been very successful in bringing in some remarkably bright folks, interesting tattooed and pierced folks that you normally wouldn't see in the Pentagon," said Stephen Welby, the assistant secretary of defense for research and engineering, at USGIF's GEOINT 2016 Symposium. "The value of the ideas they bring to the table is fantastic."

More diverse Department of Defense (DoD) hires are encouraging, yet Welby, who serves as the department's chief technology officer, told the audience that among many issues, attracting and retaining the right talent to remain competitive is the one thing that keeps him awake at night.

"I worry about being able to compete with the private sector," he said. "I don't have the flexibility in terms of compensation. What I have is an interesting mission." He worries especially about hiring talent for particular domains such as artificial intelligence and robotics.

Although Welby leads a workforce of nearly 114,000 science and engineering professionals, he acknowledges the younger generations don't find a 30-year career in a DoD lab particularly appealing. He also said the department needs to be more flexible in terms of recruiting, such as using commercial recruiters or novel methods for reaching out to industry, academia, and international partners. He noted one step in the right direction: The department's Force of the Future initiative that Secretary Ashton Carter proposed to help shape the future workforce mentions talent for the first

➔ see *Innovating* p. 12



Stephen Welby, assistant secretary of defense for research and engineering, gave his first GEOINT Symposium keynote Tuesday morning, in which he discussed ideas for attracting new talent to the DoD.

"I don't have the flexibility in terms of compensation. What I have is an interesting mission." —STEPHEN WELBY, DoD



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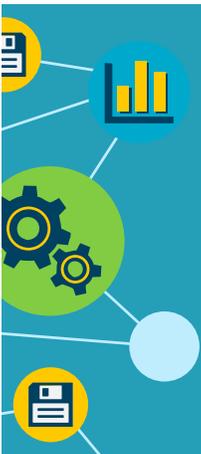
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GEOINT 2016 CLOSING RECEPTION

Join us in celebrating another great Symposium

Before returning home from the Symposium, join USGIF one last time on the Coquina Lawn Wednesday evening for the GEOINT 2016 Closing Reception from 6 to 8 p.m. Discuss your Symposium experience while enjoying food and beverages, music, and outdoor games.

FROM THE

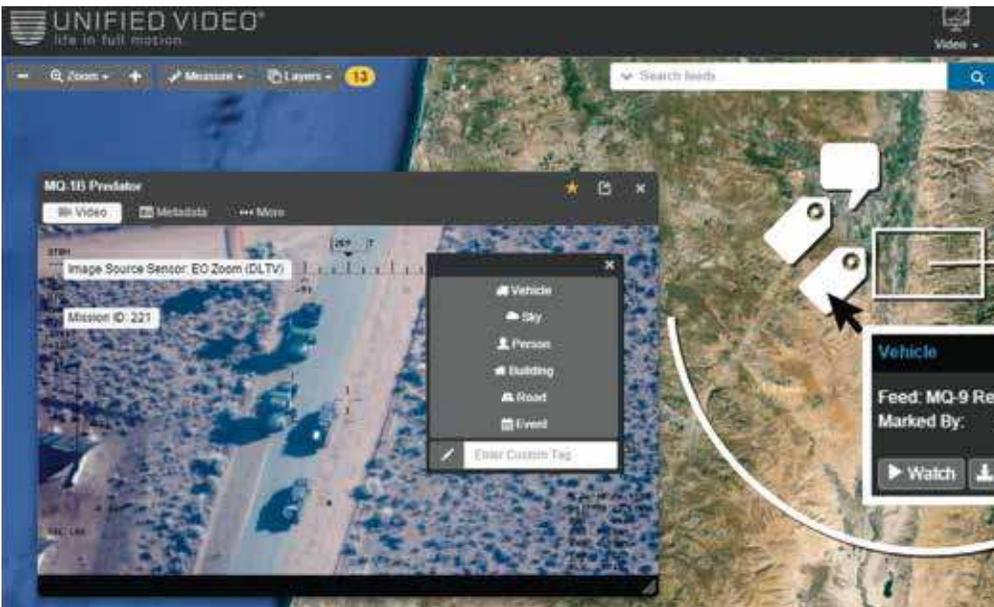


IMAGE COURTESY OF CUBIC

Unified Video provides an easy way to view, manage, organize, and understand massive amounts of real-time and archived video.

A RICH HISTORY

CUBIC DISPLAYS A RANGE OF CAPABILITIES

Cubic Global Defense (Booth 209), began as a small electronics company in 1951, and developed the nation's first electronic stadium scoreboard in 1966. It also developed the first coast-to-coast satellite surveying system far before the birth of GPS technology.

"Cubic has a long, rich history. It was involved in the GEOINT world long before the term existed," said Senior Vice President Chris Bellios. "We've continued to innovate."

At the GEOINT Symposium, the company is highlighting capabilities from two subsidiaries it recently acquired: GATR and TeraLogics. The company will showcase GATR's portable, lightweight, inflatable antennas designed to meet the needs of the military in uncertain terrain.

"A traditional satellite requires a huge C-130 to transport it," Bellios said. "This could be easily transported in a commercial plane, and is durable against the elements."

Cubic will also showcase TeraLogics' Unified Video, a secure video management system that provides an easy way to view, manage, organize, and understand massive amounts of real-time and archived video.

Cubic is also highlighting its game-based training. The company uses animation tools to simulate immersive, interactive activities. Traditional teaching tools such as podiums and PowerPoint presentations are only so effective, Bellios said, whereas games can simulate the ever-changing military environment in real time.

"A game allows you to change instantaneously, as opposed to reprinting the entire curriculum," Bellios said. "Our mission is focused on Afghanistan, but where will the terrain be tomorrow? Eastern Europe? Asia Pacific?"

In addition to its intelligence and defense community customers, Cubic is looking to expand its training technology solutions to more commercial clients.

SINGLE PHOTON LIDAR

SIGMA SPACE DEMONSTRATES NEXT-GENERATION LIDAR CAPABILITY

Sigma Space Corporation (Booth 1515) is an aerospace engineering firm providing LiDAR hardware solutions and operational and data services to DoD and commercial markets. The company is most known for being a designer and manufacturer of Single Photon LiDAR (SPL) systems.

SPL provides a highly efficient approach to rapid, high-resolution 3D mapping—requiring only one detected photon per ranging measurement, as opposed to hundreds or thousands of detected photons per ranging measurement for conventional or Geiger mode airborne LiDARs. This higher SPL efficiency offers more 3D mapping capability in terms of swath, spatial resolution, acquisition time, and density of range returns.

"Flying up to 60,000 feet on manned or unmanned aircraft with a 24/7 operational window, SPL meets the demand for LiDAR capability," said Katie Fitzsimmons, Sigma Space's director of operations.

Working in a variety of environments, SPL provides accurate visualization of urban, littoral, and rural environments while detecting and geo-locating structures, objects, and lines of communication, even when concealed under dense vegetation or manmade camouflage. With recent developments to include near-real time processing, Sigma's SPL systems can deliver data to the commands faster and with more resolution than ever before.

FLOOR

EXHIBIT HALL HIGHLIGHTS

MITIGATION THROUGH DATA MAPPING

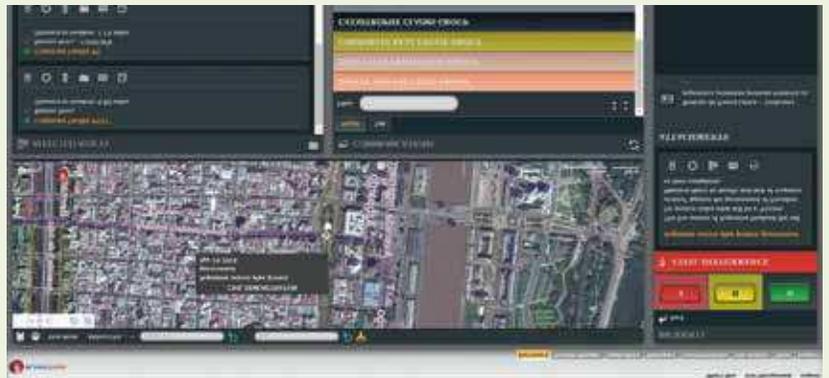
PLANETRISK USES MODELING TO ENABLE DECISION-MAKING

PlanetRisk (Booth 1420) is displaying at GEOINT 2016 its web-based AIMS Common Operating Platform, which helps analysts cope with large data sets. Featuring more than 4,000 data layers from public, commercial, and proprietary sources, the advanced intelligence management system leverages maps to help users visualize geospatial data and streamline risk management decision-making.

"We have an unparalleled data ecosystem that incorporates historic and live data streams from our 24/7 Global Intelligence Operations Center—it contains data from more than 75 vendors, as well as anything we can draw from open, deep, and dark web domains," explained Eileen Ratzer, director of analytics at PlanetRisk, formerly known as iMapData.

GEOINT Symposium attendees are invited to explore PlanetRisk's data sources firsthand via a demonstration illustrating mobile phone movements during recent protests in London.

"PlanetRisk has exclusive rights to bring a geo-enabled mobile telecommunications data source to the national security community.



This screenshot shows the incident dashboard controls in PlanetRisk's AIMS platform.

IMAGE COURTESY OF PLANETRISK

We'll demonstrate the power of that data source to reveal patterns and anomalies in behavior such that a consumer can better understand a particular slice of society or indicators of a threat," said Ratzer.

She added visitors to PlanetRisk's booth will be able to see how phones congregated during the London protests, where phones went after the activity died down, and what the activity revealed about the people involved.

"A consistent theme throughout our solution portfolio is the ability to place large, complex, and disparate data sets into spatio-temporal context. Everything we show at GEOINT 2016 is going to be demonstrative of that," Ratzer said.

PRECISION EYESIGHT

GEO OWL SPECIALIZES IN ANALYZING UAV VIDEO FOOTAGE

When Nick Smith named his company three years ago, he wanted to go beyond acronyms. "What has better eyes than an owl?" he thought. "Owls are smart, have vision, see at night. It was a perfect name for our company."



Thus **GEO Owl (Booth 1215)** was born. The company specializes in analyzing video from military-level UAVs.

"If you are looking at someone from 30,000 feet, we have to interpret the behavior that's happening on the ground," Smith said. "What types of

actions we should take—to follow them or follow a different lead."

The company works closely with the military, specifically U.S. Special Operations Command, as well as with government agencies and NGOs. Apart from military missions, the company has helped monitor Syrian refugee movements using geospatial imagery.

"We can coordinate with the different NGOs and government agencies and help them determine the types of numbers they might be looking at for people coming into camps," Smith said.

In addition to showcasing its capabilities, GEO Owl said it is also interested in meeting potential hires such as full motion video analysts at GEOINT 2016.

"If you are looking at someone from 30,000 feet, we have to interpret the behavior that's happening on the ground."

—NICK SMITH, GEO OWL

Future GEOINT Leaders

MEET THE 2015 USGIF SCHOLARSHIP WINNERS

The USGIF Scholarship Program advances the GEOINT tradecraft by granting scholarships to promising students pursuing degrees in the geospatial sciences, remote sensing, or a related field. In 2015, USGIF awarded scholarships to 24 students. USGIF has awarded \$891,000 in scholarship funds since the program began in 2004, and expects that number to reach more than \$1 million later this year when 2016 scholarships are awarded.



Crystal English

DOCTORATE

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University of California,
Santa Barbara
*Geography & Geographic
Information Science*



Joel Max

Morteza Karimzadeh
Pennsylvania State University
Geography

Ron Mahabir
George Mason University
*Earth Systems & Geoinformation
Science*



Jory Fleming

Monica Medel
Texas State University
*Geographic
Information Science*

Taylor Oshan
Arizona State University
Geography

GRADUATE

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University of Washington
Geographic Information Systems

Seth Bishop
University of Utah
Geography

Steven Gilbert
Pennsylvania State University
*Geographic
Information Systems*

Bridget Kane
University of Pennsylvania School
of Design
Urban Spatial Analytics

Joel Max
Pennsylvania State University
*Geospatial Intelligence
Applications*

Aishwarya Venkat
Tufts University
*Environmental and
Water Resources
Engineering*

UNDERGRADUATE

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West Virginia University
*Geography/
Geographic Information Systems
& Spanish*

Charlotte Ector
University of South Carolina
Geography

Jory Fleming
University of South Carolina
Geography & Marine Science

Courtney Koch
Harrisburg University
Geospatial Technology

Jeffrey Sherwood
Washington College
International Studies

Elijah Staple
University of Colorado, Boulder
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GRADUATING HIGH SCHOOL SENIORS

Elizabeth Cady van Assendelft
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Staunton, Va.
Now attending Yale University

Kyle Bathgate
Carbondale Community
High School; Carbondale, Ill.
*Now attending the
University of Illinois at
Urbana-Champaign*

Christina Bohnet
South Lakes High School;
Reston, Va.
*Now attending
Calvin College*

Kelly Carney
South Lakes High School;
Reston, Va.
*Now attending Virginia
Polytechnic Institute and
State University*

Andy Fleming
Dominion High School;
Sterling, Va.
*Now attending Texas A&M
University, West Texas*

Colin Flynn
Heritage High School;
Leesburg, Va.
*Now attending
Northern Virginia
Community College*

Daniel Gurley
South Lakes High School;
Reston, Va.
*Now attending James Madison
University*

USGIF Working Group & Committees Snapshot

Many USGIF working groups and committees are holding meetings, panels, and networking events at GEOINT 2016. These events, taking place in Osceola A unless otherwise noted, are open to all Symposium attendees and exhibitors interested in the topic or seeking to learn more about a particular working group or committee.

WEDNESDAY

Tradecraft & Professional Development Committee/NGA Advisory Working Group Discussion

Tradecraft & Training Needs of Acquisition Professionals as They Transition to Analysis as a Service

11 a.m. – 12 p.m.

This event will be a facilitated discussion between industry and government focused on exploring what contract officers, CORs, and PMs should learn about the mission in order to fully execute the analysis-as-a-service paradigm and fully incorporate commercially relevant data into the intelligence cycle outside government spaces.

Geospatial and Remote Sensing Law Working Group Discussion

Geolocation Privacy

2-3 p.m.

Historically, the law has supported the view that a person does not have



a reasonable expectation of privacy when in a public place. However, this view is being challenged by the courts, lawmakers, and regulators as both the government and the private sector are increasingly looking for ways to collect, analyze, and share geo-location information for a variety of purposes. This talk will discuss the evolution of the concept of a reasonable expectation to privacy when in public, and what impact it may have on organizations that collect, use, analyze, store, or share geo-location information.

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The Onward March of Technology

DNI CLAPPER TALKS TECHNOLOGICAL ADVANCES, CLEARANCE REFORM IN FINAL GEOINT SYMPOSIUM KEYNOTE
By Matt Alderton



DNI James Clapper gave his final GEOINT Symposium keynote address Tuesday morning, offering humor, reflection, and thoughts on the way forward.

Director of National Intelligence (DNI) The Honorable James R. Clapper celebrated his 75th birthday in March. Another important milestone for the nation's chief intelligence official, however, is the GEOINT 2016 Symposium—at which he made his final keynote address Tuesday morning.

Clapper, who will depart his post as DNI at the end of the Obama Administration, spent much of his address making self-effacing jokes about his age and Intelligence Community stereotypes. Beneath its jocular surface, however, the DNI's speech had a very serious message: Technology can be transformational—if the Intelligence Community allows it to be so.

To make his point, Clapper invited the audience to time travel to 1996, the year Congress established the National Imagery and Mapping Agency (NIMA), the predecessor to the National

Geospatial-Intelligence Agency (NGA). 1996 was memorable for many reasons—the OJ Simpson trial, the arrest of Unabomber Ted Kaczynski, the bombing at the Centennial Olympic Games in Atlanta, and the cloning of Dolly the sheep.

It was also the year world chess champion Gary Kasparov went head-to-head against IBM's chess-playing supercomputer, Deep Blue. The pair played six matches, of which Deep Blue triumphed in only one.

Twenty years later, in March 2016, man and machine faced off again with a very different result. This time, a team of scientists challenged Google robot AlphaGo to play the ancient Chinese board game Go against master Go player Lee Sodol of South Korea. Sodol was victorious in one of five matches; AlphaGo won the other four.

The difference between Deep Blue and AlphaGo is

stark, according to Clapper. The former, he said, was programmed to play. The latter, on the other hand, was programmed to learn. While Deep Blue had a limited repertoire of gameplay, AlphaGo has the capacity to become infinitely more skilled with each match it plays.

“We live in a world in which machines can learn from their own mistakes and can develop ... intuition,” Clapper observed. “What does this mean for us lowly humans—particularly those of us in the Intelligence Community—and what can we do to adapt to the onward march of technology so we don't get left behind?”

It's a question the Intelligence Community (IC) must answer, Clapper said. And with the Internet of Things becoming more expansive, time is of the essence.

“The Internet of Things ... has more than 10.3 billion endpoints [and is] projected to grow to 29.5 billion by 2020, with a market

[worth] something like \$1.7 trillion,” said Clapper, adding the IC is attempting to establish a community-wide policy on wireless capabilities.

But that's just the beginning. Ultimately, Clapper indicated, what's needed isn't a single policy for leveraging a lone technology. Rather, it's an IC-wide culture shift from resisting to leveraging technology.

“We can look at the pace of technical innovation as a scary thing—something that could take away from the advantage the U.S. Intelligence Community has now—or see it as something that will utterly revolutionize our lives for the better,” Clapper said.

Because better technology stands to yield better intelligence, the IC must prioritize access to information as much as it does the technology for acquiring information, according to the DNI. He highlighted one item in particular he hopes will be near the top of his successor's to-do list: clearance reform.

“We have to make SCI (sensitive compartmented information) clearances more ubiquitous at the state and local level ... so intelligence sharing benefits first responders,” Clapper said. “That means we need ... a much more responsive, much more agile clearance system than we have today.”

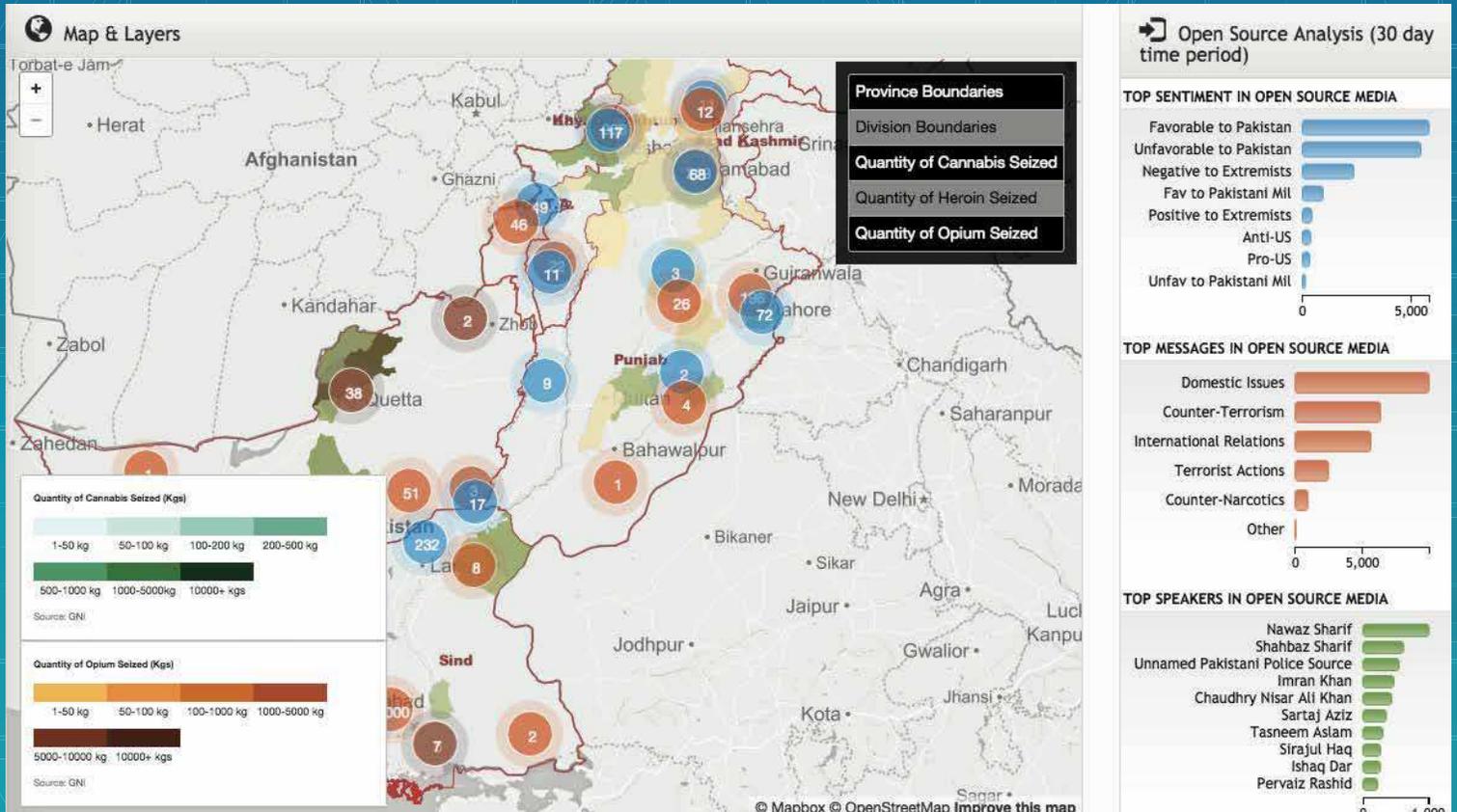
Clapper devoted the final words of his keynote not to his own legacy, but rather to that of the IC at large.

“What has been lost in the public debate about how we conduct intelligence is why we even do it in the first place,” he concluded. “What we do at its most basic level is reduce uncertainty for decision-makers.”

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Regulation: a Double-edged Sword

PANEL CONCLUDES RESTRICTIONS ON REMOTE SENSING ACTIVITIES ARE NOT WITHOUT RISK

By Warren Ferster

The U.S. government should adopt a new regulatory approach to the commercial space industry that is less defensive in nature and instead designed to incentivize innovations from which it can benefit, according to a GEOINT 2016 panel that convened Tuesday morning to discuss the revolution in remote sensing.

Case in point: Commercial satellite operator DigitalGlobe must discard three-fourths of the imagery it collects in the short wave infrared (SWIR) spectral band because government restrictions do not permit its sale to commercial customers, said panelist Walter Scott, the company's founder and chief technical officer.

"We've got to get our heads out of this Maginot Line mentality that we can stop the advance of technology around the world and instead find a way to embrace it, because at the end of the day it's all a positive good," Scott said.

DigitalGlobe's SWIR sensor, which is unique in the commercial industry, was added to the company's WorldView-3 satellite to capture data that might be of interest in a variety of markets such as agriculture. But because

SWIR is considered a nontraditional commercial remote sensing capability, the government has placed spatial resolution restrictions on the data, rendering DigitalGlobe unable to capture business opportunities that require higher-precision data.

The SWIR sensor on WorldView-3, which was launched 2014, is capable of collecting data with 3.7-meter spatial resolution, according to DigitalGlobe spokesperson Turner Brinton. But the company's operating license bars it from selling SWIR data with better than 7.5-meter resolution to non-U.S. government customers.

"We're missing an opportunity," DigitalGlobe CEO Jeffrey Tarr, who was not part of the panel, said after the panel discussion, which was moderated by Kevin O'Connell, CEO of Innovative Analytics and Training.

Such restrictions, currently a subject of debate among U.S. policymakers, illustrate a weakness in the approach to regulating commercial capabilities that were, in the not-too-distant past, the exclusive province of governments.

Douglas Loverro, deputy assistant secretary of defense for space policy, said during the panel discussion that commercial space industry regulations have traditionally been weighted more toward minimizing the national security risks associated with a

given activity than reaping the benefits. "So there's a presumption of guilt," Loverro said.

"We can do things more quickly than we have" to date, said panelist Winston Beauchamp, deputy under secretary of the Air Force for space and director of the Principal DoD Space Advisor Staff. He referenced the similar debate in the past about loosening restrictions on electro-optical imagery, and that this required convincing risk-averse officials in the DoD and the Intelligence Community.

Beauchamp called for a regulatory regime that incentivizes industry to innovate and compete, even if that makes some in the national security realm uncomfortable, because the benefits outweigh the risks. Finding the right balance is key, but opinions differ as to where that balance lies, he said.

"The last thing we want to do is fight a losing rear-guard battle

against the pace of technology," Beauchamp added.

Overregulation carries the risk not just of stifling opportunities and innovation, but of driving entire industries overseas—beyond the reach of U.S. regulators, multiple panelists said.

Not approving a given activity can have adverse national security consequences, said panelist Lisa Porter, executive vice president and director of In-Q-Tel-funded CosmiQ Works. Those consequences can include ceding technical innovation and industry leadership to other countries, she said.

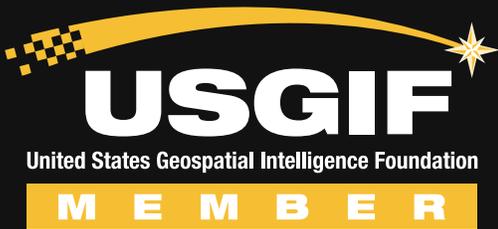
"There seems to be a false dichotomy between national security and prosperity for American industry," said Robbie Schingler, co-founder and chief strategy officer of small satellite operator Planet Labs. The U.S. government is used to being the sole driver of technology and innovation, but this is no longer the case, Schingler concluded. 🌐



Tuesday's general session featured a panel on the "Remote Sensing Revolution." Pictured from left to right: Winston Beauchamp, Douglas Loverro, Dr. Lisa Porter, Robbie Schingler, and Dr. Walter Scott.

"The last thing we want to do is fight a losing rear-guard battle against the pace of technology."

—WINSTON BEAUCHAMP, DEPUTY UNDER SECRETARY OF THE AIR FORCE FOR SPACE



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time, rather than just workforce numbers.

“The people we want to bring on board have good jobs already, and I’ve got to talk them [into] it,” Welby said. This new approach is fundamentally different from that in the past, which Welby joked was “posting something on USAJOBS and hoping a Nobel Prize-winner is trolling and looking for something to do.”

Within DoD research and engineering, Welby said, a lack of innovation doesn’t threaten the department as much as a lack of resources. In addition to delivering more cost efficiency than it has in the past, he said, the department is now looking at the culmination of a 40-year run during which the United States and its allies have possessed technological capability above and beyond that of other nations. The access to technology and talent other countries are displaying, as well as the speed of

“In almost any domain, we’re assuming we’ll be able to take advantage of data. It’s about systems that interact with their environment.”

—STEPHEN WELBY, ASSISTANT SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

the development cycle, have put the U.S. in the position of trying to restore its advantage.

Welby said it’s not surprising to see other countries investing in modernizing their military capabilities. “They are doing so at a remarkably fast pace,” he said. “We often find ourselves on the wrong side of the cost and capability curve.”

To tackle these challenges, including decreasing the speed of time to market, Welby said it’s essential the department not miss commercial sector capabilities that may help the DoD—which he emphasized will come from tech hubs around the country, not just Silicon Valley. Furthermore, he said, the department is refocusing on internal innovation.

One of the critical themes in the department is disrupting technological capabilities for potential adversaries through science and engineering, explained Welby, who oversees everything from basic science and prototyping to research at the department labs. He formerly held senior leadership positions at the Defense Advanced Research Projects Agency (DARPA).

“How do we begin to disrupt ourselves before others can disrupt us,” he asked the audience. The disruptive technologies of the 1970s, for example, have shaped today’s military in many ways. Now, he said, the disruption will be around autonomy.

“In almost any domain, we’re assuming we’ll be able to take advantage of data,” Welby said.

“It’s about systems that interact with their environment.” These include systems that facilitate human-machine collaborative decision-making, advanced manned-unmanned systems operations, and network-enabled, autonomous weapons.

“There’s been a lot of push-back on this from folks who’ve imagined Arnold Schwarzenegger movies,” Welby said, noting that removing humans from the equation and allowing computers to take over is not the intent. “Our focus is thinking about how new, software-enabled capabilities enable us to do things differently.”

Welby mentioned that recently he was in Portland for the christening of the Navy’s new Anti-Submarine Warfare Continuous Trail Unmanned Vessel, the naval equivalent of Google’s self-driving car.

“It’s fully autonomous, triple redundancy,” Welby said. “It could leave port in the U.S. and find its way to Bahrain and radio for a pilot to bring it to port. It’s a fundamental game changer to think about these capabilities.”

Innovative opportunities at the DoD range from hypersonics and biomedical—consider the applications of a wearable device to measure the health and alertness of personnel in the field—to electronic warfare and micro-electronics.

“These things will have enormous implications on military capabilities,” Welby concluded. 📍

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Government Pavilion Stage

LEADERS FROM NGA, DIA, AND DHS SHARE INSIGHTS

By Matt Alderton and Kristine Crane

Senior leaders from the National Geospatial-Intelligence Agency (NGA), Defense Intelligence Agency (DIA), and the Department of Homeland Security (DHS), gave presentations Monday afternoon at the Government Pavilion Stage in the GEOINT 2016 exhibit hall.

INTEGRATING THE GEOINT ENTERPRISE

Professionalization. Interoperability. Unity of effort. Those are the three pillars of the National System for Geospatial Intelligence (NSG) Strategy 2016, a new NSG roadmap introduced Monday by Robert Cardillo, director of NGA and GEOINT functional manager for the NSG.

Cardillo opened a panel discussion about the new strategy by leaders of the National Geospatial Intelligence Committee, otherwise known as GEOCOM. He was joined by Dustin Gard-Weiss, GEOCOM chair; Monique Yates, co-chair of the Training and Development Subcommittee; Dr. Joseph Fontanella, co-chair of the GEOINT Analysis and Production Subcommittee; and David Cacner, co-chair of the Information Systems Architecture Subcommittee.

The 2016 NSG strategy, panelists agreed, provides a destination—a fully integrated and interoperable GEOINT Enterprise—but not turn-by-turn directions for how to get there.

“This strategy is open-ended,” Cardillo said. “We’ve got a few tenets ... but the whole idea is to [create] conversations and partnerships that don’t exist yet.”

Indeed, the previous NSG strategy—NSG Strategy 2013-2018—had 24 pages. The 2016 strategy has just four. Among its highlights:

- Professionalization:** Yates said the NSG will help develop a mature GEOINT profession by employing certification across the NSG workforce; supporting cooperative learning opportunities through the creation of shared curricula, training centers, and instructors; and innovating new ways to teach and model GEOINT tradecraft.
- Interoperability:** Fontanella and Cacner said the NSG will facilitate interoperability across the GEOINT enterprise by developing and enforcing common standards, providing access to shared exploitation and analytic tools, and establishing an open, multi-domain architecture through which to deliver geospatial content to authorized users.
- Unity of effort:** Gard-Weiss said the NSG would encourage unity of effort among government, academia, and industry by looking for ways to share resources and talent, exploiting commercial sources of information, and creating repeatable metrics to holistically assess performance across the GEOINT Enterprise. If successful, Gard-Weiss concluded, the new strategy won’t merely connect NSG members—it will unify them. “We are moving from a largely bilateral, transactional mindset to one of broader community and enterprise focus,” he said.

CONTINUING NGA PATHFINDER

Many people involved with the first iteration of NGA’s GEOINT

Pathfinder project were disappointed to see it come to a close.

“There were a lot of very sad people at the end of Pathfinder 1. People did not want to return to the mother ship,” said Chris Rasmussen, source software development lead for Pathfinder—which the agency describes as “an unclassified lab to answer key intelligence questions.”

Rasmussen, together with Eric Makowsky, an NGA deputy program manager, said the work culture—specifically “the sense of curiosity and the sense of play”—were key to the project’s success.

Less than half of the Pathfinder team members were NGA employees; the rest were from the U.S. military and allied countries. Participants used Google Hangout, Skype, and Jive to enhance “thinking out loud,” with much of the work conducted between 11 p.m. and 2 a.m.

“Teams have their own battle rhythm,” Rasmussen said, adding that a diverse group of experts—statisticians, “true blue imagery

analysts,” and mathematicians worked together.

To recruit for Pathfinder 2, which began April 16, NGA used a leading question model—posing a question to candidates to gauge their thinking about complex problems—before looking at résumés.

Rasmussen said predictive analytics would be a priority for Pathfinder 2. For example, to deduce Russian energy development activity in the Arctic, the team might use commercial shipping data to analyze on-the-ground activity and predict development.

“Pathfinder is really about trying to get to the ground to build unique content,” Makowsky added.

DEFENSE INTELLIGENCE FOCUSES ON ANALYTICS

Intelligence analysis is a bit like surgery: You would expect a surgeon to be entirely focused on the operating table much like you would want an intelligence analyst charged with informing national



Senior leaders from NGA, DIA, and DHS drew a crowd to the Government Pavilion Stage in the GEOINT 2016 exhibit hall Monday afternoon.

security decisions to focus on solving a big-picture problem. Most of those decisions have multiple facets, and visualizing them all at once is helpful, said Terry Busch, chief of DIA's Integrated Analysis and Methodologies Division.

"All data fuses best on a map," Busch said. "It's the best way to convey a complicated message. It's the best way to convey change for any issue."

Within the last year, according to Busch, DIA focused on laying out the architecture for dynamically generated databases. Moving forward, it is focused on analytics.

"Geo-based analytics remain dependent on static data sets; we do little to identify gaps in situ," Busch said, adding that identifying those gaps is an increasing priority with the explosion of data. "Everything has sensors—even your [conference] badge," he said.

"We are living in a world of ubiquitous data. The granularity

and fidelity of data is mind-numbing," Busch concluded. "We love to take data and use it."

APPLYING GEOSPATIAL DATA TO IMPROVE HOMELAND SECURITY

Every time you board an airplane, you're benefitting from geospatial intelligence. Air travel is just one example of how DHS uses geospatial analysis. From border control to support at sports events to cybersecurity, DHS uses geospatial information to keep the public safe.

"What we do as a community matters to the safety of our country," said David Lilley Jr., deputy director of the DHS Geospatial Management Office (GMO).

Lilley shared how his office is bridging the gap between the Defense Department and DHS. His office also works with NGA, the Department of the Interior, and academic institutions and organizations such as USGIF.



NGA's Chris Rasmussen (left) and Eric Makowsky discussed the agency's GEOINT Pathfinder projects Monday on the Government Pavilion Stage.

GMO priority areas include: standardizing operating procedures, advancing interoperability, developing safe geospatial architecture and infrastructure, and promoting geospatial governance. There is also a big push to reduce IT duplication and fragmentation in alignment with goals set by Congress, Lilley said.

Additionally, in both the private and public sectors, there

is a growing demand for 3D and 4D information and integrating wearable devices with real-time information delivery. There is also a move away from desktop to web-based software, he said.

While it's "a struggle to keep pace with commercial technologies," Lilley said, DHS aims to inspire innovation in its contracts. 

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A Lifetime of Dedication to Tradecraft

THE HONORABLE MARTIN C. FAGA NAMED 2016 LUNDAHL-FINNIE LIFETIME ACHIEVEMENT AWARD RECIPIENT



The Honorable Martin C. Faga, former director of the NRO, was named the 2016 recipient of USGIF's Lifetime Achievement Award Monday.

the same goes, 20 years from now people will look back and say they haven't seen anything at that point."

Faga was the 10th director of NRO, where he most notably led the declassification of NRO's existence following more than 30 years of secrecy. He revolutionized NRO support to the military, downgraded the classification of NRO products, and appointed a deputy director for military support. Faga also initiated the transition of NRO's separate Central Intelligence Agency, U.S. Air Force, and Navy programs into functional directorates in signals, imagery, and communications.

Faga retired in 2006 as president and chief executive officer of the MITRE Corporation. Before joining MITRE, Faga served as Assistant Secretary of the Air Force for Space from 1989 to 1993, simultaneously serving as director of NRO. Faga received many awards and distinctions throughout his career, including the National Intelligence Distinguished Service Medal, the DoD Distinguished Public Service Medal, the Air Force Exceptional Civilian Service Medal, the NASA Distinguished Service Medal, and in 2004 was awarded the Intelligence Community Seal Medallion. President George W. Bush appointed Faga to the President's Foreign Intelligence Advisory Board from 2006 to 2009 and to the Public Interest Declassification Board from 2004 to 2009.

The Lundahl-Finnie award recipient is nominated and voted on by the USGIF Board of Directors. This distinguished award is named after Arthur C. Lundahl and Thomas C. Finnie, celebrating their accomplishments—in imagery analysis and mapping, respectively—and their legacies within the GEOINT Community. 

During the Monday morning GEOINT 2016 general session, USGIF announced The Honorable Martin C. Faga, former director of the National Reconnaissance Office (NRO), as the 2016 recipient of the Foundation's Arthur C. Lundahl-Thomas C. Finnie Lifetime Achievement Award. Faga is the 12th individual to receive this prestigious award.

Faga was unable to attend the Symposium and accept the award in person, but he instead recorded an on-camera interview about his

career and how it feels to receive this recognition.

"It's hard to express how much the award means to me," Faga said. "I actually knew Arthur Lundahl—he was retired by the time I knew him but he was very active in mentoring people in the field... To receive an award in his name is a special privilege for me. As exciting as the last almost 50 years has been, I look forward to what's happening in the future, particularly in the processing of imagery and the ability for anybody on a laptop to do almost anything they want. As

"I actually knew Arthur Lundahl—he was retired by the time I knew him but he was very active in mentoring people in the field... To receive an award in his name is a special privilege for me."

—THE HONORABLE MARTIN C. FAGA

Visit vimeo.com/trajectoryonlocation to watch Faga's acceptance interview

Advancing the GEOINT Tradecraft

2016 USGIF AWARD WINNERS ANNOUNCED

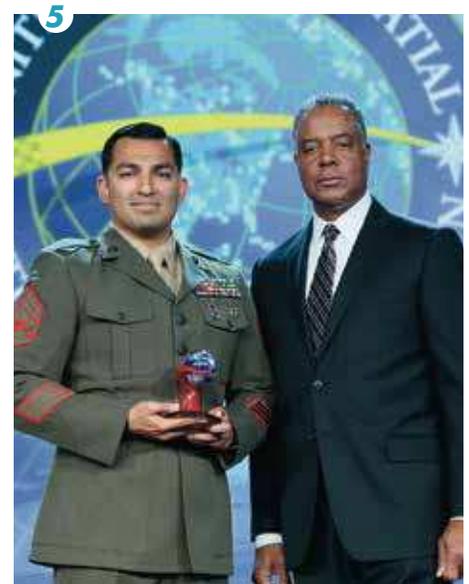
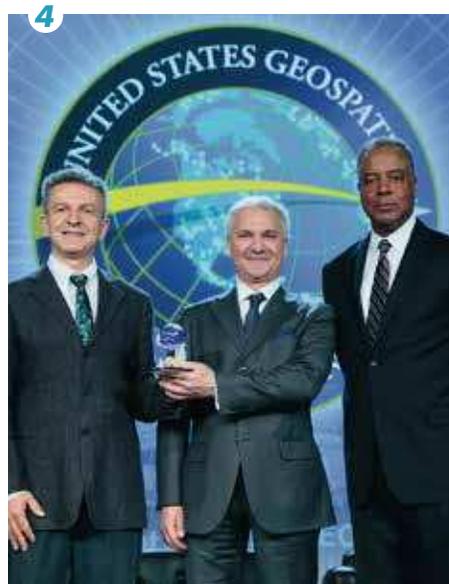
The USGIF Awards Program annually recognizes the exceptional work of the geospatial intelligence tradecraft's brightest minds and organizations pushing the leading edge. The five award categories recognize GEOINT achievements in academia, community support, government, industry, and military. Award winners are nominated by their colleagues and selected by the USGIF Awards Subcommittee.

"The number and diversity of the nominations received for the 2016 USGIF Awards Program was outstanding," said Kevin Jackson, USGIF Awards Subcommittee Chair. "From year to year the quantity of nominations may vary, but the number submitted this year sets an all-time record, and the competition in all the categories was fierce. However, some things do remain constant. Underneath the outstanding achievements of the individuals and teams that we honor each year at

the Symposium, are people of great character and commitment, each with a true sense of purpose."

THE 2016 USGIF AWARD WINNERS ARE:

1. **Academic Achievement Award:** The Geospatial Semester, James Madison University
2. **Community Support Achievement Award:** Exemplar City Inc.
3. **Government Achievement Award:** iMAP Team, Santa Clara County Fire Department
4. **Industry Achievement Award:** ABACO R&D Team, ABACO SpA
5. **Military Achievement Award:** Gunnery Sgt. Jesus M. Bocanegra, Marine Special Operations Company, U.S. Special Operations Command





7:00-9:00a

Training and Education Sessions
(Osceola Rooms 1-6)

8:00-9:00a

USGIF Modeling & Simulation Working
Group Talk (Osceola A)

9:00-9:15a

Moderator: Jim Sciutto, Chief National
Security Correspondent, CNN

9:15-10:00a

Betty J. Sapp, Director, NRO

10:00-10:30a

A Conversation with the Honorable
Michael D. Lumpkin, Director of the
Global Engagement Center,
U.S. State Department

10:30-11:30a

**Panel: Joint PED: The Services’
Approach**

- Peter H. Devlin, Marine GEOINT
Officer, U.S. Marine Corps

- Maj. Gen. George J. Franz III,
Commanding General, INSCOM
- Lt. Gen. Robert P. “Bob” Otto,
Deputy Chief of Staff for Intelligence,
Surveillance and Reconnaissance,
U.S. Air Force
- Lt. Gen. John N.T. “Jack” Shanahan,
Director of Defense Intelligence for
Warfighter Support, Office of the
Under Secretary of Defense for
Intelligence
- B. Lynn Wright, Deputy Director of
Naval Intelligence

11:00a- 12:00p

USGIF Tradecraft & Professional
Development Committee/NGA Advisory
Working Group Discussion (Osceola A)

12:00- 1:30p

Lunch and Exhibit Hall (Florida Exhibit
Hall A-F)

12:30- 1:45p

**Government Pavilion Stage
(Florida Exhibit Hall)**

- **12:30-12:45p** – Presentation of
the IGAPP Grand Challenge Award
by Robert Cardillo, Director, NGA;
Sue Gordon, Deputy Director, NGA;
and Amanda Brownfield, SVP of the
National Intelligence Account for TASC,
an Engility Company
- **12:45-1:45p** – NGA Acquisition by
Sue Gordon, Deputy Director; Mike
Geggus, Industry Innovation Advocate,
Office of the Deputy Director; Karyn
Hayes-Ryan, Component Acquisition
Executive, Director of Plans and
Programs; and Nicole Pierce, Senior
Procurement Executive, Office of
Contract Services, NGA

2:00-3:00p

USGIF Geospatial & Remote Sensing Law
Working Group Discussion (Osceola A)

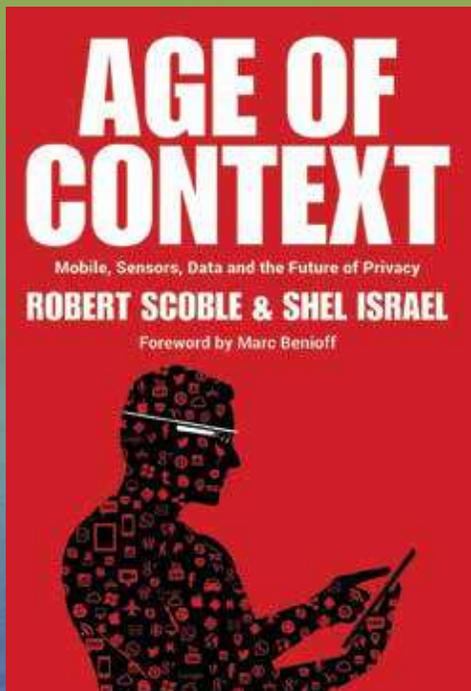
6:00-8:00p

GEOINT 2016 Closing Reception
(Gaylord Palms Coquina Lawn)

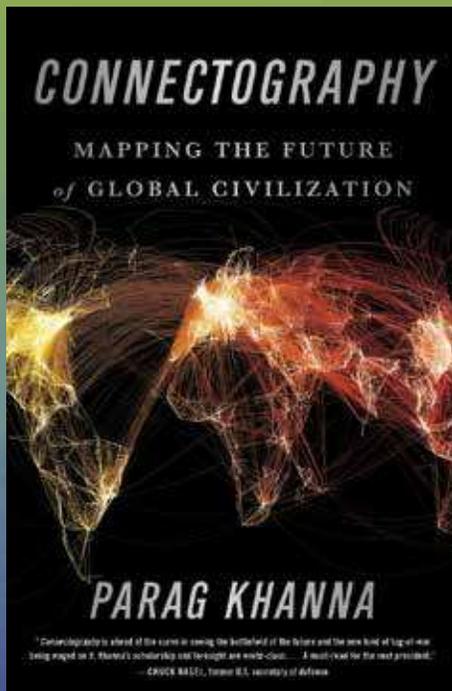
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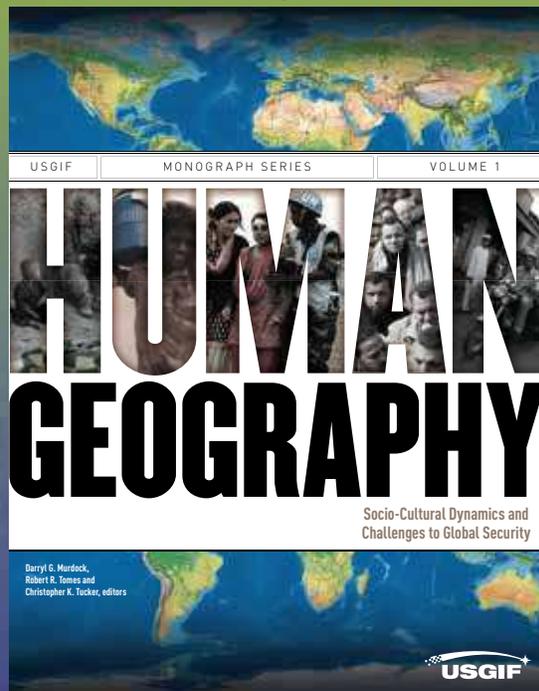


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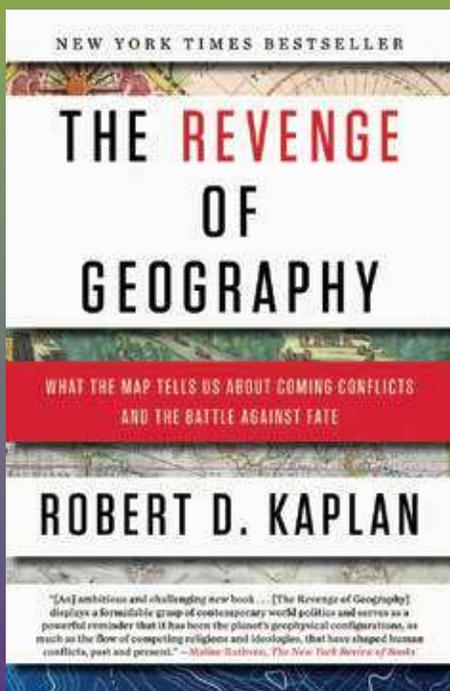


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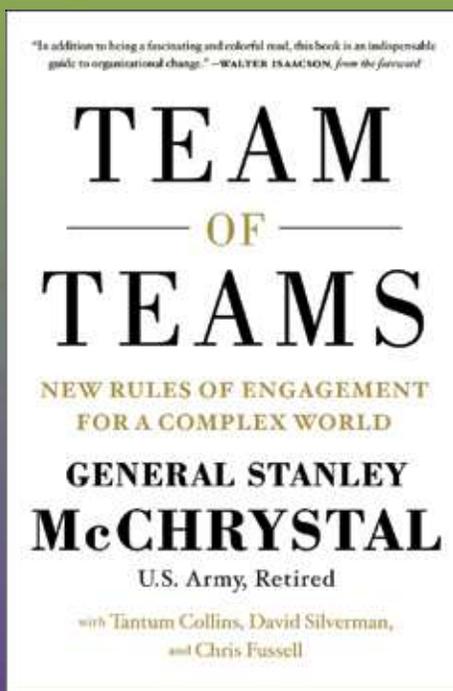
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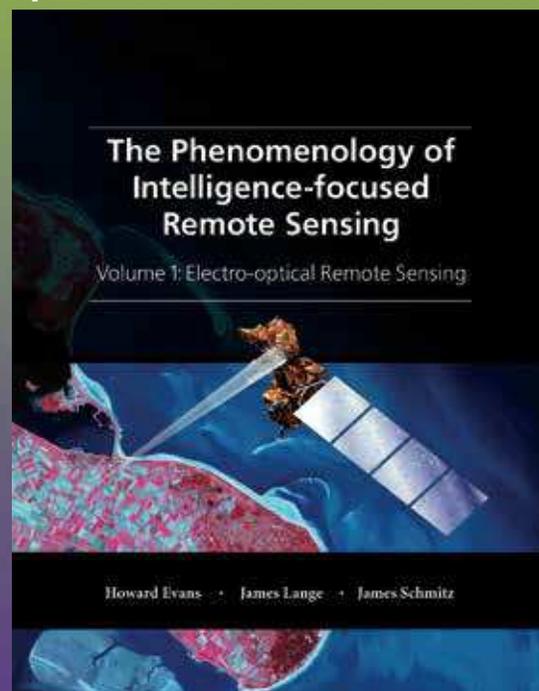


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