



NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Office of Corporate Communications

nga.mil | 571-557-5400 | publicaffairs@nga.mil | FB: NatlGEOINTAgency | @NGA_GEOINT

**Remarks as Prepared for
Sue Gordon
Deputy Director, National Geospatial-Intelligence Agency
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GEOINT Support to Missile Defense

Thank you very much for that kind introduction, Angie. I spoke earlier this morning to the GEO Huntsville crowd, and I'll reiterate that this is just a great privilege for me.

I grew up in the 1960s, during what I still think was the most exciting time for our nation – it was the golden age for space junkies. Sally Ride was a few years older than me, but became a close personal friend. And Buzz Aldrin is still a hero of mine. Did you see that Buzz recently posted on Twitter and Facebook his travel voucher for 21 amazing days in July 1969?

He started from Houston, and his subsequent destinations were: Cape Kennedy, Moon, Pacific Ocean, Hawaii – where he had to go through Customs! And return to Houston. He was reimbursed a whopping 33 dollars, because his “meals and incidentals” were provided by the government. Can you imagine if they paid him for mileage? Almost half a million miles, there and back?

Anyway, it's an absolute thrill to be here in “The Rocket City” – where those days remain so special. I'd love to start by sharing with you how Geospatial Intelligence contributes to national security in general terms. Then I'll work my way toward much more specific GEOINT support to the Space and Missile community. But I hope the first part is interesting to you as well.

Here's the bottom line up front as to why GEOINT is important to national security –one simple reason: the power of geolocation. Everything exists in a time and a place. Therefore, every local, regional, and global challenge – national security, climate change, energy resources, urbanization, and many more – has geolocation at its heart. That means GEOINT can be the foundation that every other type of intelligence can add layers to – in order to present the full picture.

Now, at NGA, we have a highly skilled, dedicated, and diverse workforce of about 13,000 women and men – civilian, military, and contractor. Our HQ is in Springfield, VA,

but we also have two other major locations: St. Louis and Arnold, Missouri. But more than 2,000 of our people serve at more than 100 locations around the world — in more than 25 countries, at key embassies, and across 16 time zones. And they support more than 160 military units from every armed service, including many who serve in harm's way.

Since September 11, there's been a quantum leap in the number and complexity of the growing threats to the U.S. and our allies. As the Director of National Intelligence Jim Clapper has said – repeatedly – our country is facing the most diverse and most challenging threats of the past 50 years. As he briefed Congress, there's cyber warfare, terrorism, weapons of mass destruction, space warfare, economics and natural resources, and human security as the most pressing global threats.

There are also regional crises of a destabilized Middle East, the rise of China, and Russian aggression against its peaceful neighbors. We also face the global challenges of climate change, violent natural and man-made disasters, disease pandemics, mass urbanization, and international criminal networks.

All of us recognize that the world is changing faster than ever before, that the threats are morphing more rapidly, and that so many more unknowns exist at any given time and place. We have to react to these threats and emerging crises in hours, if not in minutes.

When you see a headline or hear a news report about an international crisis or a domestic or international disaster, NGA plays a vital, behind-the-scenes role to help policy makers, warfighters, and first responders confront every challenge. For example, when U.S. Embassy personnel recently left Yemen, NGA helped plan their safe evacuation route to the Sana'a airport in a time-sensitive situation.

Every local, regional, and global challenge – national security, climate change, energy resources, urbanization, you name it – has geolocation at its heart. And it's NGA's mission to provide timely, relevant, accurate geospatial intelligence – or GEOINT – so policy makers, intelligence analysts, warfighters, and first responders understand these changes and make the best decisions to protect the nation.

So we take a leading role in how the national security community views this changing world – both as a combat support agency and a national intelligence agency. Our customers range from the President – for strategic warning, to the military – for operations planning, to the first responder – for disaster relief.

Basically, anyone who sails a US ship, flies a US aircraft, makes national policy decisions, goes into harm's way, responds to disasters, fires a missile ... or even navigates with a cellphone ... relies on NGA. We don't make the GPS system, but we help make sure it's accurate.

These are challenging times, and we're stretching our global understanding in new ways: From nation state strategies to "lone wolf" tactics, from static analysis to dynamic prediction, and from periodic observation to persistent coverage.

Back to the concept of geolocation. Today, there are more than 3 billion Internet users and more than 2 billion smartphones – not just mobile, but smartphones. During the next decade, the impact of the Internet will spread rapidly to the "O3" – that is, the "Other 3" billion people who will have access in the future. And the "Internet of Things" will emerge with geolocation sensors in everything from self-driven automobiles to our clothing.

The dependence of everything and everyone on their geolocation – their time and place – makes what NGA does – spatio-temporal analysis – the bridge to the future of commerce, cooperation, and security. So, what's spatio-temporal analysis? It's a fancy phrase that means we examine and evaluate people, places, things, and events, in and across time and place. We look at questions from a broad, geographic point of view. We use geospatial data to analyze questions with scientific methods that give unique perspectives grounded in reality.

Spatial thinking is the ability to put together the myriad pieces of a static jigsaw puzzle. The puzzle could be the religious and ethnic groups in Syria and Iraq, their locations, and their relationships. Since every human activity is always changing through not just space, but time, the human jigsaw puzzle is constantly changing – pieces moving in and out, shapes of pieces themselves changing, the puzzle spinning or changing dimensions. So to have any hope of anticipating an accurate picture as it changes, analysts have to also evaluate these spatial changes over time. And that's the temporal piece.

So analysts need to examine an increasing number of and increasingly complex geographic variables that at any moment can turn into a crisis. We now live in a world where everything and everyone is a geospatial sensor – with a geolocation – and geospatial methods lead the way to understanding this planet. That world is also more transparent than ever before. Every smartphone makes every user a news reporter. Every Internet user can search free, highly accurate maps of any spot on the earth. Every nation, friend or foe, is finding it more and more difficult to keep their secrets. Our goal in GEOINT is what we call "spatio-temporal dominance."

Because when we truly master understanding of a situation, we provide real value to our customers, so they can obtain positive consequences. Policymakers and warfighters reach their goals and accomplish their missions faster and better than before, because they can rely on GEOINT to deliver what they need when they need it to make the right decision. That's how we define our success: If our customers succeed, we succeed. If they're not successful, we fail. So that's what makes NGA increasingly valuable in a future in which everything and everyone is interconnected.

We used to be primarily a product provider – we produced fact-filled reports that were posted or sent to customers when they asked for them. Today, we try to be dynamic, persistent, and pro-active, to guide our customers to success.

Since the end of the Cold War, there's been a quantum leap in the speed of change, the volume of data now measured in terabytes, the immediate impact of global communication, and the increasing difficulty with predicting change with any accuracy. But our leaders, warfighters, and first responders need to be able to anticipate change, such as those that happen in a fluid crisis like in Ukraine. We need to apply our deepest understanding of spatio-temporal reasoning as the heart of national strategic decision making.

So we're rapidly developing tools and methodologies called Activity Based Intelligence – or ABI – that allow us to manage the volume and velocity of Large Data. That helps us to discover the “unknowns” – the networks and patterns of activities through which we can better understand difficult situations that could be happening anywhere. And we're developing analytic tools and technologies – like automated algorithms that search for patterns.

Think of sophisticated war games and 3-D simulations, to give you an idea of how analysts across the Intelligence Community are becoming integrated by ABI. ABI isn't a system. It isn't a platform. It isn't a sensor. And it's not a workstation. ABI is a mindset. It's putting pieces together to tell a coherent story. It allows us to see and exploit patterns of life and discover new information from a tsunami of data. We want to engage not only our government partners, but also our commercial partners, to implement ABI across the full spectrum of GEOINT providers. And it all starts with Object Based Production – OBP.

OBP allows us to bring information from several intelligence sources together for a single object. In the GEOINT Community, we do that through SOM – Structured Observation Management. For example, let's assume that the object we're interested in is a lighthouse. In this example, we'll apply 3 primary foundation GEOINT domains to that lighthouse: Topographic, Aeronautical, and Maritime. For the Topographic domain, we determine where the lighthouse is located. For the Aeronautical domain, we're looking at vertical obstruction -- how tall is the lighthouse? For the Maritime domain, we find out what type of light is the lighthouse using. How fast the light is blinking, for example, or how fast it turns, as an aid to maritime navigation.

In our old structure, you would have had to go to all 3 GEOINT domains to get all this information. But since we can now organize our information around objects, you only have to look up the lighthouse as an object, to get information from all of these domains in one location. So we're able to inform the entire IC how tall the lighthouse is, the type of light, and where it's located. Once the GEOINT picture is sent to a central information depository for objects, all the intel disciplines will align their information to that same object. For the first time, we'll have a complete picture of what we know -- not just where

the lighthouse is, or how tall it is, or what kind of light it has, but who's using it, and what they're using it for.

Organizing our data for the entire intelligence community is the foundation for allowing us to do advanced ABI. Once that happens, analysts will be able to spend less time searching for data, and more on deeper analytics.

The world has changed drastically – the government doesn't own space anymore – it's not a monopoly. One of the most challenging things affecting our analysts in the near future is the SmallSat revolution. Some people are uncomfortable with what seems to them to be uncontrolled movement of more and more sensors into space. We're not – we're energized and enthused about it. And it's admittedly pushed GEOINT to an inflection point.

In the next 5 years, more than a dozen constellations, with hundreds of small satellites, will launch, and continuously scan the earth. The SmallSat revolution will totally change the way we sense the planet. It's much more than just images – it means our analysis of world events is going to be holistic and persistent.

What we call the “democratization” of GEOINT and the “darkening of the skies” is the opportunity of our time for our people. We won't need to balance a finite collection capability against a seemingly infinite set of GEOINT requirements. In part because the skies are about to darken with all these commercial SmallSats, in part because we now have a requirement to be just as successful in the open as we are in the classified world – with the need to support humanitarian assistance and disaster response efforts in places like West Africa, Nepal, and even ... North Alabama – there's been what we call a “seismic shift” in the way we operate.

We truly need to be able to “succeed in the open” – and that's very different from the rest of the IC. In fact, that's one of the reasons that we're partnering with GeoHuntsville on GeoQ development.

Succeeding in the open also includes sharing information and capabilities with a global community of experts. We were the first intelligence agency to deliver source code into GitHub, allowing everyone to have access to some of our tools. We know the global community benefits from this commitment.

We have tools now in use by individuals and organizations that have never used things from us before. For example, the great city of Huntsville uses our GeoQ tool to enable disaster response users to quickly identify impacted areas. It gives the city authorities the ability to task and disperse response resources appropriately, all while recording and reporting the location, well-being, and tactical actions of the responders, in real-time across the response spectrum.

Now, how we provide our GEOINT Services is just as important as what we provide. That includes everything that helps our customers get what they need from us sooner

and easier than ever before. It's our responsibility to provide a framework – geospatial reference – for all data and activities in a manner that advances understanding.

And of course, every piece of intelligence has some sort of geographic aspect to it – whether it's a phone call, internet message, bomb threat or human asset – so coloring in those aspects of the intelligence picture is what NGA does best. It's how we provide content and services to our customers, and how NGA customers can share content, solutions and best practices with us and the community. So we're shifting our role as a service provider.

Instead of delivering geospatial and application silos as we have in the past, now we focus on the seamless discovery of content, regardless of physical location. Each of our customers in every domain has access to geospatial data and mission services, providing the foundation for common processing and analytic capabilities across the IC.

Beginning last month, NGA has had access to the unclassified Amazon Web Services (AWS) infrastructure, which has allowed NGA programs to develop and deploy in an unclassified environment, with the same baseline software we use on our classified networks.

We still have work to do. We need to improve the reach and depth of our acquisition capabilities, from the quality, content, and clarity of our requests for proposals ... to improving our industry engagements.

We created an industry innovation advocate this year, and his mission is to understand the challenges we face and to identify solutions. And we created the GEOINT Solutions Marketplace (GSM) to share, explore and shape ideas and solutions. It offers transparency into our vision and market research and the solutions we may need to reach solution.

We know we'll be increasingly challenged by the speed of innovation and the demands for agility, but that's fine with us. Personally, I've been in this job since January, and I draw on 3 seminal experiences from my background almost every day:

First, I've been involved in acquisitions ranging from huge collection systems to a few lines of unique code. That taught me about rigor and flexibility in acquisition.

Second, at CIA, I delivered the concept that became In-Q-Tel – from idea to incorporation by a group of private citizens. That taught me how innovation happens in government – and that we can make big ideas happen in a very short time with enough energy and the right partners.

And third, my 3 decades in government taught me that entrepreneurship can actually exist in a bureaucracy, and that the power of coalition is a stunning force.

I really believe that we can accomplish what we need to, if we work with energy, skill and a clear-minded view of the outcome.

So, we need partners who understand this and help us find ways forward. We in government have the advantage of purpose and perseverance. Industry and academia have the advantage of innovation and energy. Our capable international partners have the advantage of different points of view. The combination of all of these factors is magic.

It's Team GEOINT. That includes other members of the Intelligence Community, and other members of the U.S. Government. It includes open, online communities of geographers and technologists. There's a place for big business, and a place for small business and start-ups. Universities and think-tanks are members.

For example, at the USGIF GEOINT Conference in June, Alabama A&M University and the University of Alabama were officially recognized as two of the Centers for Academic Excellence. They have access to our NGA problem sets, to apply cutting-edge geospatial science research to real-world opportunities. So, if you're interested, and you have value to contribute, we want you on the team!

Together, we can use our skills and collective power to advance our craft, extend capabilities, and connect the community of practitioners. Together, we have continual, informed and ongoing contributions, and flexible, open data-sharing arrangements. Together, we find innovations, inventions, and methodologies to benefit the rest of the team.

One very important member is the Missile and Space Intelligence Center – MSIC. We have a long-time partnership with MSIC through our NGA Support Team – NST – on Redstone Arsenal – and I'd like to tell you about them. And this is where I get down to some specifics about how we interact with the Space and Missile community.

The NGA team at MSIC focuses on the research and development of short-range-ballistic missiles, surface-to-air missiles, C2, directed-energy weapons and anti-satellite systems. They also provide direct support to missile launch event review studies, denial and deception analysis, command and control network studies, and missile launch capability and accuracy studies. They facilitate the flow of unique and Scientific-and-Technical-GEOINT (S&TG) capabilities between NGA and MSIC.

So NGA analysts in Huntsville provide some very valuable tradecraft based-expertise, with an average of 25-years of GEOINT-based knowledge and insight into analyzing missile testing and launch events. It's expertise like that that's essential when NGA needs to assess things like responsibility for the SA-11 that shot down Malaysian Airlines Flight 17 over Ukraine. It takes multiple forms of GEOINT, along with other sources, to really understand the whole picture.

The NST has a partnership with the Missile Defense Agency (MDA), too. They keep MDA in the loop on all NGA production that pertains to the missile defense mission set.

One example is tracking North Korean short-range-ballistic missile (SRBM) launches. And the Army Materiel Command (AMC) and the NST also have a close relationship – they've worked together on local exercise support.

The NST at Huntsville also provides handheld imagery, photogrammetry and computer-aided design (CAD) to support counter denial and deception in the development of new U.S. aircraft. It provides planners and developers with CAD models that convert into radar signature representations for auto target recognition systems on advanced fighter platforms, like the F-22 and the F-35. This joint program has benefitted NGA, because DIA and the Air Force Research Labs have funded multiple training, travel, software and computer equipment purchases for analysts to support the effort.

We couldn't be prouder of them, and I'm looking forward to visiting with them this afternoon.

One of the most famous Alabamians of all time was Helen Keller. She was just inspirational beyond belief – overcoming blindness and deafness, to be admired by many of the world's greatest minds – including Einstein and Churchill. Well, Helen Keller once wrote: "Alone we can do so little; together we can do so much." That's really what I want to leave you with.

The Space and Missile Defense community as part of Team GEOINT really makes sense for all of us. We're doing great things together. And I really believe this is a key moment in time for those of us on Team GEOINT. We're adapting to a seismic shift in our profession. And we're very glad to have you as such tremendous partners.

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