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Over a Decade into the 21st Century…What Now? What Next?

Strategic Multilayer Assessment

7th Annual Conference

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This report represents the views and opinions of the workshop participants. The report does not represent official USG policy or position.

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Executive Summary

The 7th Annual Strategic Multi-layer Assessment (SMA) Conference was held at Joint Base Andrews from 13-14 November 2013. The theme of the conference was *Over a Decade into the 21st Century…What Now? What Next?* The conference was focused on global megatrends and their implications in all spheres of national security. It is no exaggeration to state that the world today is a very different place than it was barely 12 years ago when the war against al Qaida and its affiliates began. As we move forward, continuing advances in various spheres such as the sociotechnical world will present both challenges and opportunities. The conference examined these and related themes and highlighted new insights from the social and neurosciences.

As in previous years, the conference addressed the needs of the Geographical Commands. Representatives from the Commands discussed their pressing needs and key operational requirements so that SMA's wide network of experts could assist in identifying capabilities that match these needs.

Findings from Panel Discussions

Guest speaker Brig. Gen. David B. Béen, Deputy Director, Special Actions and Operations, J-3, spoke about the unique ability of SMA to bring together representatives from a diverse community—including from the DoD, academia, industry, media, etc.—to address core requirements of the Combatant Commands (COCOMS). This community can help the DoD succeed in its main duties: 1) being mindful of future threats to the United States and 2) exploiting emerging opportunities to make the world a more stable place. The DoD has a responsibility to engage in rigorous analysis, informed debate, and top-flight research with partners. Members of the SMA support community also bear certain responsibility to build relationships, learn more about operational needs, and apply their considerable talent to help operators achieve mission success.

Guest speaker Mr. Earl Wyatt, Rapid Fielding Office, Office of the Assistant Secretary of Defense for Research and Engineering, spoke about the need to bring various resources from across the government, industry, and academia to bear on DoD's objectives. The force of the future will be leaner, more agile, more flexible, and technologically advanced. While U.S. forces will be called on to do more with less, this is not a down time for innovation; it is a challenge to do more with less. The DoD will be particularly challenged to engage in innovative thinking to mitigate threats in nonkinetic ways. Partner capacity will be key to this conversation. The DoD is moving toward a more balanced prototyping portfolio to include developmental as well as operational prototyping to provide a hedge against technical uncertainty or unanticipated threats; enhance interoperability and reduce lifecycle costs; and explore the realm of the possible without commitment of follow-on procurement.

Guest speaker Mr. Ben Riley, Rapid Fielding Office, Office of the Assistant Secretary of Defense for Research and Engineering, spoke about the value SMA provides to the DoD by bringing together a diverse group of academic and technical perspectives on difficult problems. However, the DoD still needs to open its aperture more widely to encounter new ideas and perspectives. In a time of resource constraint, there is a tendency to circle the wagons around traditional defense programs, but it is important to continue to engage in rigorous, innovative, and unexpected thinking to meet the commanders' needs.

Keynote speaker, LTG Michael Flynn, Director, DIA, spoke about accelerating change in the defense intelligence community. The two big challenges facing the defense intelligence community are skyrocketing demand and resource reduction. In order to meet the two challenges, the DIA needs to restructure and adapt. The DIA needs a new model to prepare the foundation that provides U.S. forces with agility, flexibility, and resiliency. The USG must be prepared for unknown, highly complex, uncertain environments. One failure of the last decade has been our limited ability to understand the operational environment, which led to mismatch in resources and capabilities. This failure needs correction in order to meet the challenges of tomorrow.

Panel One discussed the use of religious engagement by the United States to improve global prospects for peace. It is important that the USG engages the full realm of social actors when trying to understand operational environments. Within this group, religious leaders are some of the most influential actors—specifically in Muslim communities. In many cases, religious leaders are more credible than the highest-ranking political officials in that community are. U.S. organizations like the Special Envoy to the OIC have committed to religious engagement in areas including healthcare, maternal health campaigns, religious freedoms, and countering violent extremism. The panel agreed that the commitment by the United States to continued religious engagement in these areas and beyond is crucial. Furthermore, the United States must ensure that its religious engagement efforts are viewed as legitimate by the local communities in the places where the religious engagement is taking place.

Panel Two discussed four significant megatrends likely to emerge in the next decade: demographic change, resource stress, further diffusion of power, and individual empowerment. There are two particularly relevant projections that support the diffusion of power megatrend: 1) by 2030, Asia will have surpassed the United States and Europe in power and size while Europe, Japan, and Russia continue to decline, and 2) by 2030, the international system will transition from hegemony to multi-polarity. With regard to the resource stress megatrend, competition and scarcity involving natural resources are emerging as security threats for the United States and its allies. U.S. allies are particularly vulnerable to natural resource shock. The perfect storm involves youth bulge, unemployment, ability to organization through information technology, and a food shock. Furthermore, the convergence of multiple trends means individuals and groups are angrier and more dangerous. With regard to demographics, the most relevant finding for the USG is that the ratio between young adults and older adults in some of the world's most instable

regions is declining, which statistically suggests greater stability and democracy in the coming decades. However, some of the countries that the USG is, or has been, most involved in still have high fertility rates and very youthful populations.

Panel Three examined the current era and why it is special. First, it has produced an increasing number of mega-issues. Mega-issues are not simply larger public policy issues; they are significantly different from issues of the past. There are two primary mega-issues facing the current era: mega-disasters and megacities. The mega-issues of today are challenging because the currently existing policy is not designed to deal with this magnitude of challenge. Furthermore, other issues facing the current era—such as under-development, ethnic diversity, regime stability, etc.—can only be addressed through collective action and a global perspective. However, this is quite difficult because many of these issues are viewed differently throughout the world. Finally, it is important to be careful when trying to compare different eras in different times. Analysts today are likely biased in thinking that the current era is unique because they are living in it. This era may be unique, but it is not yet clear that is the case.

Panel Four reviewed the role of social sciences in national security as well as validation and validity concepts. Understanding and utilization of social sciences is critical for DoD operations in the 21st century. Social science uses theory to understand intentions and to explain causal links between actions and outcomes. We need an entire spectrum of social science disciplines (economics, sociology, communications, history, etc.) to understand complex problems. From an operational viewpoint, a set of validated social science theories are a good foundation for building a framework capable of informing decision-making. However, social science theories are often not validated for specific military decision-making processes. Thus, it is dangerous for operators to treat a discipline's theories as fact without first consulting with scientists familiar with the limits of those theories. There is a mismatch between the defense and social science culture. One necessary way to bridge the divide is to train and develop a cadre of military social scientists.

The Feedback from Commands Panel provided an opportunity for representatives from the commands to discuss their pressing needs and key operational requirements. First, all of the commands emphasized the need for greater cooperation within the DoD as well as the whole of government. Building relationships with non-traditional and non-government entities, like those attending the SMA conference today, are increasingly important in a resource constrained environment. USNORTHCOM identified countering threat networks as its primary operational focus. Therefore, it is imperative for DOD to invest in interagency collaboration and provide support to law enforcement partners in combating transnational organized crime. This will provide for a better understanding complex, transdimensional networks. PACOM has the most diverse portfolio of all of the COCOMs; therefore, its requirements range from nuclear deterrence, counterterrorism, geo-political stability, transnational crime, natural disaster response, cyber security, and human trafficking. PACOM's chief objective is to stay in steady state operations while strengthening relationships with countries in its area of responsibility (AOR). AFRICOM faces multiple

challenges as well including terrorism, weak governance, natural resource management, illicit trafficking, humanitarian assistance, training, border security, maritime security, and defense institution building. AFRICOM relies on soft levers of power to address many of these issues. CENTCOM is facing new threats (threat financing, supporting rule of law, etc.) that traditional military forces have not had to face. These threats require a multi-layered solution that relies on cooperation, liaison, and engagement with non-traditional partners. SOCOM's challenges include an uncertain future, volatile trends, redistribution of power, and the increasing role of non-state actors (NSAs) and transnational criminal organizations (TCOs). Other threatening trends include youth bulges, shifting demographics, and urbanization. Globalization and accelerated change place pressure of the system making the scale of the problem worse. SOCOM will meet its challenges by strengthening its global soft power network. This means increasing the capacity of allies, partners, and the interagency community to respond to the world's problems. SOUTHCOM's mission sets include counternarcotics trafficking, counter TCO, and disaster response. SOUTHCOM has always operated with resource constraints. It has developed strong interagency partnerships to compensate.

Panel Five discussed the "new" face of transnational criminal organizations (TCOs). The continually evolving strategic environment, coupled with the ascendant role of TCOs, necessitates a comprehensive understanding of these organizations. TCOs represent a globally networked national security threat and pose a real and present risk to the safety and security of Americans and their partners across the globe. The TCOs of today are profit driven organizations. One of the key challenges in combatting TCOs is to identify the illicit networks and finance organizations that are the oxygen of a TCO. TCOs are sophisticated organizations that are constantly evolving and trying to combat them is becoming more difficult. Often times, legislation does not keep up with the sophistication and evolution of these TCOs and their tactics. It is imperative that legislation continues to evolve as the TCOs become more sophisticated. Furthermore, when combatting TCOs, it is essential that a collaboration effort exist between the defense, intelligence, law enforcement, and other interagency partners. The United States must continue to build the capacity and capabilities of its partners and the interagency community in combatting the TCO threat.

Invited speaker Brig Gen Timothy Fay, JS/J33, noted that during the Feedback from COCOMs panel, none of the representatives mentioned nuclear deterrence, yet it is one area where the DoD needs SMA's help. One of the biggest challenges of nuclear deterrence is the lack of articulate, informed, rigorous discussion and research. For example, little effort has been applied to understanding the illicit networks that built many of today's nuclear programs such as that of Pakistan and North Korea. Urban legends—such as that the United States no longer needs or uses its nuclear arsenal—continue to drive the debate. Strategic weapons are made for deterrence, not deployment. We use these weapons every day. They are effective and a part of our adversary's decision calculus. Another challenge facing the DoD today is how to further adapt policy and strategy in alignment with a smaller arsenal and a more uncertain world environment. SMA has done some great work to contribute to this conversation, but there is a lot more that needs to be done.

Panel Six discussed the sociotechnical world and its new era of disruption and opportunities for innovation. The rapid and continual coevolution of the social and technological sectors is creating a globally pervasive sociotechnical ecosystem. The current security problems facing the United States are social change problems. As a result, it is crucial to understand the full social realm—narratives, networks, interests, identities, vocabularies, desires, and disgusts. Cultural dynamics drive the evolution of technologies as much as the actual technological problem. Connectedness is a new dynamic that is crucial and underpins the current era. Connectedness is what makes mega-issues and mega-events possible. When talking about the framing of problems on a global scale, it is the awareness of the problem that makes it mega, and connectedness increases overall awareness. The operational environment is constantly evolving. The question becomes, how does the United States operate in this changing environment, and what does this change mean for stability? Stability needs to be defined as the ability to adapt to a changing situation. The new status quo is that there is no status quo.

Invited speaker, Lieutenant General Robert E. Schmidle, Jr., USMC, spoke about the intersection of national security and universal principles. He argued that universal principles do not exist; context matters. Some saying the admonition not to kill is a universal principle, but killing to defend oneself is permissible. He further argued that the assumption that rationality guides decision-making is also flawed; man can reason his way through anything. Instead, people rely on hinge beliefs—practices that define a culture. Not knowing or understanding a partner's or adversary's hinge beliefs puts one at a disadvantage from the beginning. The search for universal principles is debilitating to our ability to come up with a coherent national security strategy.

Panel Seven examined the importance of understanding megacities in the 21st century. Megacities are rapidly growing and changing population centers where urbanization often far outstrips the ability of governments to enforce rule of law and provide basic socio-economic services such as clean water, sanitation, etc. As a consequence of these deficiencies, these densely populated urban areas can become spawning grounds for public resentment, criminal activity, and political radicalization, which is a national security concern for U.S. policymakers. Understanding megacities is crucial. Urban areas are the key terrain of the future. Developing world megacities thus far have been surprisingly resilient, but the potential for a natural disaster or threat to sovereignty from a non-state actor loom. Megacities are new phenomena and must be understood for future U.S. defense and diplomacy actions. A significant challenge to understanding megacities is the sheer amount of data that is involved in the process of understanding, making interagency collaboration and information sharing key. A method for making sense of all of this data and visualizing it clearly needs to be created. There is a need for a planning support framework for understanding megacities—a model that marries the benefits of rigorous critical thinking with the applied setting in which planners and operators work. A method needs to be

developed for fusing these two aspects together to produce a more holistic understanding of megacities.

Panel Eight explored long- and short-term regional and sub-regional stability in South Asia and the Western Pacific region. Panelists argued that the division of South Asia into two COCOM AORs makes it difficult for analysts and planners to address transboundary concerns. Furthermore, analysis must take place at the regional or sub-regional level. India is a rising power, but it is cautious not to be seen as a counterbalance to China. India wants regional balance, participation in the region's strategic dialogue, and translation of dialogue into actual cooperation. Countries in Asia are concerned about what the future presence of the USG in the region will be given budgetary constraints and China's aggressiveness in the South China Sea. Countries in Asia will still look to the United States for security, but they will also begin diversifying.

Panel Nine discussed neuroscience and its implications for national security operations. The Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative is a new research effort started by President Obama to revolutionize the understanding of the human brain by accelerating the development and application of innovative technologies. Approximately $100 million will be invested for scientific research during FY 2014 as part of the BRAIN initiative, which will be led by the National Science Foundation (NSF), National Institutes of Health (NIH), and Defense Advanced Research Projects Agency (DARPA). The study of the brain is important because it is the wellspring of human behavior. In the national security domain, especially, there should be an interest in understanding the brain because it is part of the ecology that drives human behavior that is important to national security. Neuroscience allows us to access and engage the brain. This insight into the brain is beneficial for the healthcare, public life, global relations, and public defense realms. It is clear that neuroscience represents a viable science and technology pursuit for the next 10 to 20 years. Areas for growth that need to be developed over this timeframe with respect to understanding the brain include improving the understanding of how the brain recognizes problems, influences culture, and functions in groups.

In conclusion, LTC Matthew Yandura thanked the panelists, moderators, and conference attendees for another successful SMA annual conference. He encouraged participants to build on relationships formed during this conference. There has to be value in relationships or conferences like this go away. The military community should remember that they are not just recipients of this scholarship and research; they are part of the community in service of this nation.

Workshop Introduction, LTC Matthew Yandura, JS/J-38/MISO

Master of Ceremonies, LTC Matthew Yandura, JS/H-38/MISO, welcomed participants to the 7th Annual SMA Conference. The theme of the conference was *Over a Decade into the 21st Century…What Now? What Next?* The conference was focused on global megatrends and their implications in all spheres of national security. It is no exaggeration to state that the world today is a very different place than it was barely 12 years ago when the war against al Qaida and its affiliates began. As we move forward, continuing advances in various spheres such as the sociotechnical world will present both challenges and opportunities. The conference examined these and related themes and highlighted new insights from the social and neurosciences. As in previous years, the conference addressed the needs of the Geographical Commands. Representatives from the Commands discussed their pressing needs and key operational requirements so that SMA's wide network of experts could assist in identifying capabilities that match these needs.

SMA Overview, Dr. Hriar Cabayan, OSD/SMA

The SMA office provides planning support to Combatant Commands (COCOMs) with complex operational imperatives requiring multi-agency, multi-disciplinary solutions that are not within core Service/Agency competency. The SMA office has developed a proven methodology merging multi-agency expertise and information to address complex operational requirements that call for multi-disciplinary approaches utilizing skill sets not normally present within any one service/agency. The SMA process uses robust multi-agency collaboration leveraging intellectual/analytical rigor to examine factual/empirical evidence with the focus on synthesizing existing knowledge. The end product consists of actionable strategies and recommendations, which can then be used by planners to support course of analysis (COA) development. SMA is accepted and synchronized by Joint Staff, J3, DDGO and executed by OSD/ASD (R&E)/RSD/RRTO.

Fiscal year 2014 planned projects include a future-looking Asia-Pacific strategic risk assessment effort requested by USPACOM. The effort will examine future political, security, societal, and economic trends; identify where U.S. strategic interests are in cooperation or conflict with Chinese and other interests worldwide, particularly in the East China Sea; and leverage opportunities when dealing with China in a "global context." The second FY14 project is a U.S. Engagement Options in Sub-Saharan Africa effort proposed by USAFRICOM. This proposed study has two primary objectives: a) to provide actionable insight into the stability and instability dynamics in a core AFRICOM-identified area of interest; and b) to develop an evaluative tool to aid in prioritization and metric development for command engagement activities.

Guest Speakers

Brig Gen David Béen, JS/J-38

Brig. Gen. David B. Béen is the Deputy Director, Special Actions and Operations, J-3, the Joint Staff. In this capacity, he is responsible to the Vice Chairman, Joint Chiefs of Staff, for overseeing and managing all special access programs support to the combatant commanders, interagency, and national command authority. General Béen was commissioned in May 1987. He earned his navigator wings at Mather AFB, Calif., in 1988. He has been a squadron weapons officer and U.S. Air Force Weapons School instructor, has commanded deployed combat flying units at the squadron and group level, and has commanded an operational wing. He has flown 1,200 combat hours over Kosovo, Afghanistan, and Iraq, and has more than 4,000 total flight hours, primarily in the B-1. His staff assignments include NATO joint plans action officer, Military Assistant to the Commander-in-Chief at a NATO regional headquarters, and most recently, Director of Manpower, Organization and Resources, A-1, at Headquarters U.S. Air Force.

On behalf of the Chairman, Joint Chiefs of Staff, General Dempsey, and Joint staff Director For Operations, Lieutenant General Waldauser, welcome to the 7th Annual Strategic Multi-layer Assessment Conference. I am Brigadier General David Been, the Joint Staff J-38, Deputy Director for Special Actions and Operations, and conference co-host.

From 2001 to present, our Service men and women have gained an unmatched level of combat and operational experience in Iraq, Afghanistan, and other global hot spots. We have learned many valuable and often painful lessons along the way. It is therefore wholly appropriate that the Joint Force captures the experience of our troops as they redeploy. It is equally important that we learn from the experience of our DoD civilians, academics, scientists, commercial service providers, non-profit groups, and members of the media—many who have been with us all along.

Let there be no mistake: our primary responsibility is to ensure we succeed in our current conflicts. However, we share two additional and equally important duties:

1) First, we must be mindful of future threats to the United States and our way of life.
2) Second, we must be ready to exploit emerging opportunities to make the world a safer more stable place for all.

By studying megatrends on behalf of our subordinate commands, we are better able to accomplish these objectives. Though the views expressed at this conference do not necessarily represent my own or those of the Joint Staff, these diverse views do reflect a commitment from the Chairman: a commitment to rigorous analysis, informed debate, top-flight research, and the field experience of our military, DoD civilian professionals, commercial, non-profit and media professionals. You, the panel attendees, bear a certain responsibility as well. The ideas offered by the super-star line-up of guest speakers and presenters merely represent potential combat power.

It is up to you, the representatives of the Geographic Combatant Commands, functional commands, intelligence agencies, interagency partners, captains-of-industry, research, academia, media professionals and others to decide what, if anything, to do with this information. While at the conference today, I extend a challenge to each of you: I challenge you to make a relationship with someone new, someone whom you would not have met otherwise save for this conference. And once you have made the relationship, build on it. And through that new relationship, be better for having come here today. Certainly, we are better for having you, and we thank you all for coming.

On that note, I want to personally thank the Director, Defense Intelligence Agency, Lieutenant General Mike Flynn for attending the conference and agreeing to give our keynote address today. Sir, we are all looking forward to your comments. Last, I am grateful for the funding support that the SMA program receives from the Office of the Secretary of Defense, Acquisition, Technology and Logistics (OSD-AT&L) and their continued cooperation with my office. Without OSD-AT&L there would be no SMA program and we are humbled to play a role in serving the Joint force and larger US defense enterprise.

Mr. Earl Wyatt, OSD, ASD R&E/RFD

Mr. Wyatt is the Deputy Assistant Secretary of Defense, Rapid Fielding in the office of the Assistant Secretary of Defense for Research & Engineering. Mr. Wyatt is responsible for policy and oversight of fielding capabilities that counter unconventional and time-sensitive threats. He facilitates rapid technology transition within the Department through discovery and demonstration of advanced technology concepts and works with interagency and coalition partners, industry, and academia to facilitate the timely satisfaction of validated priority operational needs.

The Department of Defense has increased its focus on the Pacific, a region characterized by contests and connectedness. The question relevant to the SMA community is, "What new tools can government, industry, and academia bring to the U.S. military to help maintain stability in this strategically important region?"

In the face of declining budgets, the defense community must reinforce the objective of introducing new capabilities more affordably. To do this, the defense community must think differently about the tools and analytic approaches it uses, ask how it should approach problem solving, and develop new frameworks to combine resources and instruments of national power in new ways.

There is opportunity for innovative thinking when talking about mitigating threats in nonkinetic ways. Addressing partner capacity is key to this conversation. What can our partners bring to the table that we have not previously considered? How do we strengthen them and integrate their capabilities with ours?

State-on-state (regular) conflict has been relatively rare since the Napoleonic era. More than eighty-percent of conflicts worldwide since that period have been irregular (state on non-

state, or non-state on non-state). How does the defense community address that as part of its calculus for conflict?

As the U.S. presence winds down in Afghanistan, the U.S. military will naturally get leaner. A fighting force can compensate for reduced force structure by being increasingly agile, flexible, and technically advanced. Innovation will allow us to do more with less and prototyping will play a key role in the discovery and development of those capabilities that will enable agility and flexibility.

These challenges are reflected in the DoD strategic guidance (Figure 1), which has resulted in an expanded focus for the Rapid Fielding office. Previously focused on winning the current fight, Rapid Fielding has now been directed to employ a prototyping strategy to explore concepts and technologies that will increase the agility and flexibility of tomorrow's leaner force, and do it in an affordable way.

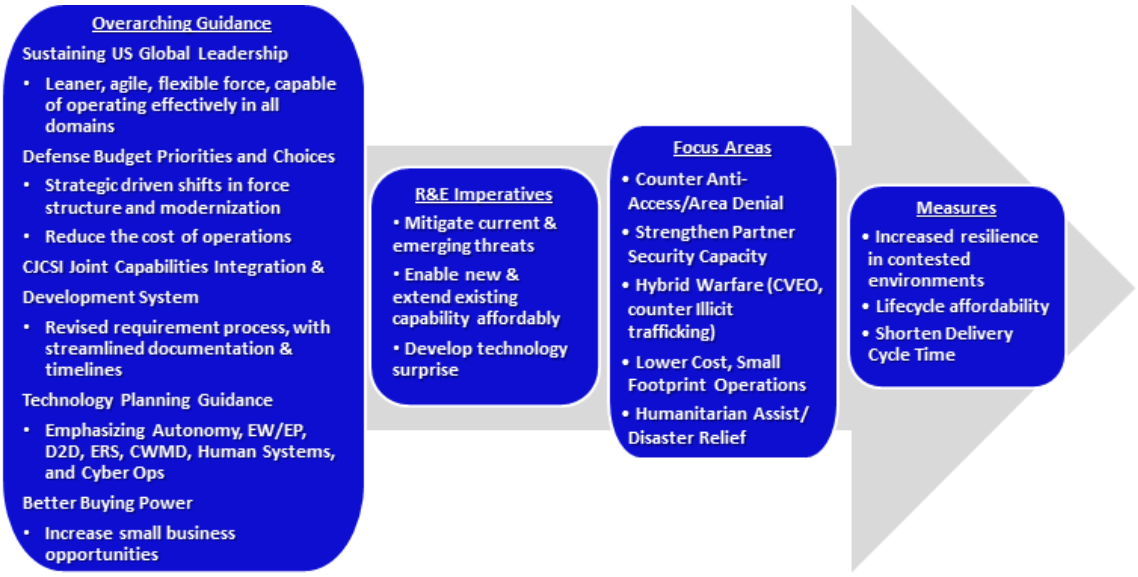

Figure 1. Emerging Capability Prototyping

When the Rapid Fielding Office focused on the current fight, it asked of its capabilities: Is it good enough? Can we get it to the troops fast enough? The new focus on prototyping to meet new challenges raises additional questions: Can we reduce the cost so we can buy enough? How extensible are the capabilities we develop? What open standards and best practices can we promote to increase the pace of technological development? Our new focus on prototyping will address these questions.

We do not know where the next conflict will be or exactly what capabilities will be needed. Prototyping will allow us to affordably develop hedging technologies without the resource intensive commitment of a full production run.

The DoD is moving toward a more balanced prototyping portfolio, adding developmental to our current portfolio of operational prototyping, enabling us to:

- provide a hedge against technical uncertainty or unanticipated threats;
- enhance interoperability and reduce lifecycle costs; and
- explore the realm of the possible w/o commitment of follow on procurement.

Relevant challenges to the SMA community include the following.

- How to best employ social sciences to challenge fundamental assumptions regarding stability?
- What S&T investments have deterrence / influence affects in phase 0?
- How to best pursue concept development for the next generation of conflict and help devise effective strategies to achieve stability?
- How can we obtain useful insights from large data sets and which analytical tools best enable such efforts?
- How to best integrate social science methods into DoD planning tools?
- How can we better operationalize social media?

Mr. Ben Riley, OSD, ASD R&E/RFD

Mr. Riley is the Principal Deputy, Deputy Assistant Secretary of Defense, Rapid Fielding in the office of the Assistant Secretary of Defense, Research and Engineering. Mr. Riley is responsible for policy and oversight of fielding capabilities that counter unconventional and time-sensitive threats. He facilitates rapid technology transition within the Department through discovery and demonstration of advanced technology concepts and works with interagency and coalition partners, industry, and academia to facilitate the timely satisfaction of validated priority operational needs.

Mr. Riley reflected on the last 10 years that SMA has served the DoD. Many good things have come out of SMA. For example, the SKOPE cell at SOCOM had its origins in an SMA effort. The value of SMA is that it brings together a diverse group of academic and technical perspectives to work on difficult problems. However, the DoD still needs to open its aperture more widely to engage in more ideas and perspectives.

One thing that was brought to my attention this summer was that the conflict in Syria was preceded by six years of drought that displaced many people from rural parts of the country and forced them to the city. Syria had an unhappy population before the conflict. The frustration is that the data on the drought is out there for anyone to take, yet we do not vector that into our thinking. Throughout history, one primary generator of war is water—that is nothing new.

While participating in a Defense Science Board (DSB) study on counterinsurgency, a PSYOPS, now MISO, representative briefed the DSB members on a spectrum of programs. When the chair of the panel asked about programs targeted towards the general population, the representative said, “Oh yeah, that’s important too.” The DoD has learned a lot since then.

Now the DoD faces resource constraints. This could pose a threat to organizations like SMA that conduct multilayered analysis. The tendency is to circle the wagons around tradition defense programs. However, this group helps answer the big question of what is really important.

SMA should continue to focus on answering commanders' needs. This is especially relevant for the SMA Megacities effort. What does the commander need to know about megacities? In the last week, PACOM has been called on to provide disaster relief in the Philippines. How can we aid the PACOM commander going forward in anticipating and preparing for such events? That is the big challenge.

Keynote Speaker: LTG Michael Flynn, Director, Defense Intelligence Agency

Lieutenant General Michael T. Flynn graduated from the University of Rhode Island in 1981 and was commissioned a second lieutenant in Military Intelligence. His first assignment was as a paratrooper of the 82nd Airborne Division at Fort Bragg, North Carolina. Since that time he has served in a variety of command and staff positions to include, Commander, 313th Military Intelligence Battalion and G2, 82nd Airborne Division; G2, 18th Airborne Corps, CJ2, CJTF-180 Operation Enduring Freedom (OEF) in Afghanistan; Commander, 111th Military Intelligence Brigade at the Army's Intelligence Center at Fort Huachuca, Arizona; Director of Intelligence, Joint Special Operations Command with duty in OEF and Operation Iraqi Freedom (OIF); Director of Intelligence, United States Central Command with duty in OEF and OIF; Director of Intelligence, the Joint Staff; Director of Intelligence, International Security Assistance Force-Afghanistan and U.S. Forces-Afghanistan, Special Assistant to the Deputy Chief of Staff, G-2, and Assistant Director of National Intelligence, Partner Engagement. LTG Flynn became the 18th Director of the Defense Intelligence Agency on 24 July 2012.

LTG Michael Flynn, DIA, spoke about accelerating change in the defense intelligence community. When LTG Flynn spoke to the SMA community last year, he detailed how Ben Riley and the Rapid Fielding Office were instrumental in assisting U.S. armed forces during the last decade of war. The future of warfare is unpredictable. We go in with some capabilities, but necessity drives invention during wartime. If you go back to 10 September 2001, there were things we did not have that were generated due to the last decade of war. One failure of the last decade has been our limited ability to understand the operational environment, which led to mismatch in resources and capabilities. This failure needs correction in order to meet the challenges of tomorrow.

The DIA needs a new model to prepare the foundation that provides U.S. forces with agility, flexibility, and resiliency.[1] Our batting average of predicting conflict is zero. The USG must be prepared for unknown, highly complex, uncertain environments. The two big challenges

[1] Defense Intelligence Agency. (September 2013). Get Ready: DIA Is Ready for a Changing World [video file]. retrieved from http://www.youtube.com/watch?v=76M08-s8c_M

facing the defense intelligence community is skyrocketing demand and resource reduction. In order to meet the two challenges, the DIA needs to restructure and adapt.

Global megatrends anticipate a complex and uncertain future for a world transforming at an unprecedented rate. Between 2010 and 2030, the world's population will grow by more than a billion people. Almost all of that growth will be in the developing world. By 2020, the number of Internet users is expected to double to over four billion. By 2035, global energy consumption is expected to rise by 50 percent with developing countries estimated to make up 84% of demand. By 2025, the combined GDP of China and India will be bigger than that of France, Germany, Italy, Japan, UK, United States, and Canada put together. The USG has traditionally thought and planned in short time periods, but it needs to start thinking long term.

The megatrend of population growth and urbanization is troubling. The shifts occur north-south, not east-west. In the southern part of the world, huge cities are growing. This kind of population growth comes with a lot of risks and challenges.

Changing the way we think changes the way we fight. Irregular has become regular. Crisis has become routine. Warfare demands precision. Each threat requires an integrated, multi-national response. Therefore, the DIA must embrace a new model for defense intelligence in order to provide decision advantage in the face of budget constraints and shifting security priorities.

The world is precision and network centered while the last century was centered on fire and maneuvering. DIA is responsible for providing strategic warning, but strategic warning is in minutes or days versus months. The implications of the newest warfighting domain—cyber—are yet to be understood. Additionally, the USG has to make sure it can operate in urban domains—that is the new terrain. Furthermore, disease will pose a major threat as the world becomes one big petri dish.

The United States Government and its population have to decide whether we are going to be world leaders or isolationists. If we are going to be a world leader, we have to be where we can lead. We have to bring our strengths to others to help them strengthen themselves. Partners are critical to success in the future. If there is anything to be learned from SMA, it is the value of seeking relationships with nontraditional partners.

To meet these challenges, the DIA is implementing a centers-based model. The centers do not align with COCOM AORs in order to bridge the gaps and seams between them. Analysis will be integrated; stovepipes will be removed. In addition to reorganizing the DIA, we must train analysts for the future—that means training them to become data scientists.

Discussion

You stated that urban areas are the new dominant terrain. Twenty-five years ago, the Army was trained to avoid urban areas and move around them. Today, we cannot get the troop-to-population ratios necessary to secure major cities. How do we address this concern?

This is why understanding the population and precision is so important. The DIA has an embassy attaché system, but its size and reach is limited by foreign policy, cost, and red tape. Yet, if we want to truly understand a population, how do we understand what is going on from Washington, D.C.? We have to partner with countries that know and understand the problems they face. Additionally, U.S. intelligence, surveillance, and reconnaissance (ISR) is very good in jungles, yet it is the urban terrain where we are going to be challenged. Understanding the population of cities cannot be done from 25,000 feet up. We need people on the ground with the courage to be there. Diplomatically, we get a lot of pushback to the ideas of bringing in forces with these capabilities because of risk. We have to have a hard conversation to get people to understand the challenges we face. We are behind where we need to be.

You have said that tactical information is laden with strategic significance. Who have you been able to persuade that that is so?

There is no need to persuade anyone; it is obvious from the battlefields of Iraq and Afghanistan and is proven every day. Tactical actions can change the face of war. We are in the age of the strategic corporal. It is a given that tactical actions have strategic consequences. There are multiples examples of this.

Panel One: Improving Global Prospects for Peace: Perspectives on U.S. Religious Engagement (Moderator: LTC Matthew Yandura, JS/J38/MISO)

The world is a very different place now than it was over 12 years ago when the war against al Qaida and its affiliates began. Though a number of challenges to political and social stability remain, one of the questions before America now is not what should it do about terrorism, but what can it do about peace? As a global leader, the United States bears a dual responsibility in dealing with the world as it is, while striving with allies and partners toward a future we all desire. This panel explores how U.S. religious engagement can improve prospects for stability and peace around the world.

Panel Members:

- Mr. Rashad Hussain, U.S. Special Envoy to the OIC
- Ms. Nermien Riad, Coptic Orphans
- Chaplain COL Dan Ames, Joint Staff
- Dr. Chris Seiple, Institute for Global Engagement
- Ms. Neha Ansari, The Express Tribune of Pakistan, Karachi Pages

LTC Matt Yandura moderated the panel. *Lieutenant Colonel Matt Yandura serves in the Deputy Directorate for Special Actions and Operations, Joint Staff, as an Operations Officer. LTC Yandura holds a Master of Arts in International Relations from The Catholic University of America, Washington, D.C and received his commission as a distinguished military graduate from Central Michigan University in 1996 with a Bachelor of Applied Arts in Interpersonal-Public Communication. During his military career, LTC Yandura has served in a range of challenging command and staff assignments. He is qualified and experienced as a Public Affairs, Psychological Operations, and Information Operations Officer. LTC Yandura is a former Presidential Writer, The White House, with additional public sector experience as an open- source intelligence analyst, and senior program manager for a DC-based global media firm. Personal awards and decorations include the Bronze Star Medal, Combat Action Badge, Senior Parachutist Badge, Saudi Arabian and Dutch Parachutist Badges, and various other unit and service awards. LTC Yandura is married to the former Mary Elizabeth Emerick and they have one child, Logan (5).*

LTC Yandura introduced the panel and underscored the importance of understanding U.S. religious engagement given the increasing trend of religiosity across the globe.

Mr. Rashad Hussain, U.S. Special Envoy to the OIC

President Barack Obama announced the appointment of Mr. Rashad Hussain as his Special Envoy to the Organization of Islamic Cooperation (OIC) on February 13, 2010. The OIC is comprised of 56 nations and is the second largest international body after the UN. As U.S. Special Envoy to the OIC, Mr. Hussain seeks to deepen and expand the partnerships that the United States has pursued with OIC countries and Muslim communities around the world. Mr. Hussain has also served as Deputy Associate Counsel to President Obama, focusing on national security, new media, and science and technology issues. Mr. Hussain worked with the National Security Staff in developing and pursuing the New Beginning that President Obama outlined in his June 2009 address in Cairo, Egypt. Before joining the White House, Mr. Hussain was a member of the legal staff for the Presidential Transition Team. Mr. Hussain previously served as a Trial Attorney at the U.S. Department of Justice. Earlier in his career, Mr. Hussain was a legislative assistant on the House Judiciary Committee, where he focused on national security-related issues.

Mr. Hussain spoke about religious engagement activities by the U.S. government. In addition to engaging with the OIC at a multilateral level and with many governments of the OIC at a bilateral level, the U.S. Special Envoy to the OIC spends a substantial portion of its time engaging with civil society. It is important to engage the full realm of actors when trying to better understand operational environments. Within this group, religious leaders are some of the most influential actors. In many cases, religious leaders are more credible than high-ranking political leaders.

Because of concerns regarding the importance of maintaining separation of church and state, some in the government are hesitant at times to engage on issues involving religion.

But just as we engage other parts of civil society, there is significant room to operate within the parameters of the First Amendment when engaging religious leaders.

Four areas of religious engagement by the U.S. Special Envoy to the OIC include countering violent extremism, polio eradication, maternal and child health campaigns, and religious freedom. In the area of health, one of the key areas where the Special Envoy has been working with religious leaders is the eradication of polio. There have been challenges in dealing with this disease. In some endemic countries, a conspiracy theory had spread that the polio vaccine is part of a sterilization campaign. To combat this theory, the U.S. Special Envoy to the OIC has engaged with religious leaders and other organizations within civil society. For example, religious leaders in places like Nigeria have been instrumental in making it clear that there is a religious mandate to have children vaccinated, which often makes parents much more comfortable with the polio vaccine. Concerning religious engagement in the context of religious freedoms, the U.S. Special Envoy to the OIC has been working with religious leaders on a number of projects. One of these projects focuses on the protection of religious minorities in Muslim majority countries. Persecution of Muslim minorities has been a problem in Muslim majority countries including Egypt, Nigeria, Pakistan, and Iraq, and this is an issue that the U.S. Special Envoy to the OIC has been working on very closely with religious leaders.

The U.S. Special Envoy to the OIC has engaged with religious leaders in Afghanistan on numerous occasions. One of the key areas of engagement in Afghanistan focuses on countering violent extremism, which is often committed in the name of religion. As U.S. leaders have emphasized, force alone will not be the solution to countering violent extremism. Often times, the most persuasive argument that can be made to the youth that have grievances will be made through a worldview that they can understand. As a result, U.S. engagement with religious leaders who can connect with youth is crucial in getting across the desired message.

Educational efforts will also be critical in ensuring that terrorists are not able to exploit youth by indoctrinating them with violating ideologies. The United States and its partners must effectively communicate that violence is not the answer to commonly held grievances and that violent extremism is often most destructive to Muslim communities themselves. Persuasive voices and actors in the religious space must do a better job communicating these messages to properly address the long-term challenge of countering violent extremism.

Ms. Nermien Riad, Coptic Orphans

Ms. Nermien Riad is the executive director of Coptic Orphans, which she founded in 1988. Coptic Orphans has directly benefited over 30,000 vulnerable children in Egypt. Today, the organization spearheads programs to address illiteracy, education and civic engagement. It has established a grassroots network of over 450 volunteer child advocates, and mobilizes thousands of donors and supporters internationally through awareness campaigns. Ms. Riad initially began this work on a voluntary basis for 12 years before becoming full time Executive

Director in 2000. Since becoming Director, Coptic Orphans programs have expanded to include development programs in literacy and girls' education, interreligious engagement, as well as a microfinance initiative to help widowed mothers become more self-sufficient. Coptic Orphans has been showcased as a unique model for Diaspora-led development. Under Ms. Riad's leadership Coptic Orphans received the "Spirit of Hope" award from the Children's Fund; the Npower Technology innovation award, was a semi-finalist in the Washington Post Excellence in Nonprofit Management Award; and was selected as "one of the best small nonprofits in the Washington, DC area" by the Catalogue for Philanthropy. Ms. Riad is also the recipient of the United Nations Association of the National Capital Area Community Human Rights award. She holds a Master of Arts in Public Administration from Virginia Polytechnic Institute, as well as a Bachelor of Science in Electrical Engineering. Prior to establishing Coptic Orphans, Ms. Riad worked as an Engineer with the United States Foreign Service throughout the Middle East; as well as with the Internal Revenue Service.

Ms. Nermien Riad, Coptic Orphans, began by defining the word Coptic, which means the Christians of Egypt.

What can the USG do about peace? Can we say that the Christians of Egypt have a dampening effect on violence and the escalation of violence?

The removal of the Muslim Brotherhood from power in Egypt brought a wave of violence for Christians in the country. Christian churches were looted and burned and by the end of the attacks, the Coptic Patriarch announced that 43 churches had been destroyed and over 200 churches were vandalized. This was the worst attack against modern-day Christians in Egypt.

Although the attacks were severe, the Christian response provides hope. They did not attack or take up arms. In one case following the attacks, a Christian church flew an Egyptian flag with the words "we forgive" written on it. In another instance, members of a burnt down Christian church returned to their destroyed church to pray for their extremist brothers. The official statement from His Holiness was, "We sacrifice our churches for the sake of Egypt." Ultimately, the Christian community in Egypt deescalated violence.

This de-escalation is exactly the type of response that the United States desires. However, what was the U.S. response to the Christian community's actions? The United States responded with silence. The United States does not quite have a phobia of engaging Christians in Egypt, but it does seem to be allergic to the idea. So, given this, what should the United States do? First, do not let what happened to the Jewish community in Egypt happen to the Christians of Egypt—basically a community squeezed out of its own country. The United States would likely not want to see history repeat itself. Second, understand that United States interests lie in the preservation and sustainment of this now weakened Christian community, which is the counterbalance for hate and violence. Third, support the work for non-governmental organizations (NGOs) that have the respect and trust of the

Egyptian community. These NGOs are guiding local programs towards respect and peaceful coexistence.

Chaplain (Colonel) Dan Ames, Joint Staff

Chaplain Dan Ames currently serves as the Joint Staff Chaplain, Office of the Chairman of the Joint Chiefs of Staff. In that capacity, he advises and assists the Chairman, the Joint Staff, and the Combatant Command Chaplains on religious affairs as they affect policy, operations, organization, and military personnel and their families across the Department of Defense (DOD). In conjunction with the Joint Staff's J-5 Office of Trans-Regional Policy and the National Security Staff, Dan recently helped develop the DOD portion of the national strategy for religious leader and faith community engagement.

Chaplain Ames first addressed two questions. What does the U.S. DoD and religious engagement have in common? Why is a Christian Army Chaplain talking about religious engagement on behalf of the U.S. military?

Chaplain Ames noted that, initially, he was personally opposed to chaplains performing religious leader engagement. He began research into why the United States should not conduct such activities. He discovered what appeared to be red flags with respect to religious leader engagement, to include an apparent lack of proper training, time, or security to effectively engage. However, he began to discover that indeed some good things were happening as a result of ongoing engagement. Religious engagements were being conducted well for the most part, partnerships between the US military and indigenous religious leaders were contributing to peace and stability, Soldiers' lives were being saved, and the needs of the communities engaged were being met.

A year later Chaplain Ames was assigned to Iraq and found that his full time job was to engage religious leaders. On his first day, he met with a Chaldean Catholic Church bishop who was a major player in multi-faith engagement in his province. This bishop had opened several provincial orphanages and needed help and support from the United States in telling his story and encouraging his cause. A week later, Chaplain Ames met with the Government of Iraq's deputy minister of Hajj (the Muslim's pilgrimage to Mecca as a sacred duty), who held prayer beads, which Chaplain Ames had not seen before. When asked about the beads, the deputy minister said, "We must always be in prayer." This resonated with Chaplain Ames' own faith and helped him realize that while there were vast theological differences among religions, there were, however, some common values, and based on those values, much work that could be done together to help Iraq move forward. Later, Chaplain Ames met with a local Christian pastor whose church had been bombed many times. This pastor had opened a clinic and daily food closet to help his Muslim neighbors. Even though this pastor was a Christian, he helped out all of the people in his community—regardless of religion. This pastor needed help from the United States in meeting the needs of his community.

Eventually, Chaplain Ames became convinced that religious leader engagement is important. Currently, there are military leaders at all levels doing this type of engagement,

but much more needs to be done. Chaplain Ames concluded that he came into the world of religious engagement kicking and screaming, but he is now a believer and is committed to making religious engagement work.

Dr. Chris Seiple, Institute for Global Engagement

Dr. Chris Seiple, Ph.D., is the president of the Institute for Global Engagement, a research, education, and diplomatic institution that builds sustainable religious freedom worldwide through local partnerships. A graduate of Stanford, the Naval Postgraduate School, and the Fletcher School for Law & Diplomacy, he is also the founder of The Review of Faith & International Affairs, a Senior Fellow at the Foreign Policy Research Institute (Philadelphia), and a member of the International Institute for Strategic Studies (London). His book, The U.S. Military/NGO Relationship in Humanitarian Interventions (The U.S. Army War College, 1996), is a seminal work in the field.

Dr. Seiple noted that the Institute for Global Engagement is a think and do tank that builds religious freedoms worldwide through global partnerships. The Institute for Global Engagement works where government and grass roots comes together because no change is truly sustainable unless you are working at this nexus point. The Institute for Global Engagement is a faith based, Christian organization that figures it is a function of its faith to love God and neighbor.

Dr. Seiple spoke to three areas of focus regarding religious engagement: 1) engaging the world as it is, 2) relaying the good and bad news about were the USG currently stands with respect to religious engagement, 3) presenting the types of models we should think about for religious engagement going forward.

Engaging the world as is. No matter how globalization is defined, its number one impact is the siege of identity. One must think about worldview to fully understand what motivates people. Religion plays an important role in worldview. Additionally, it is critical to understand that all religion is local—not all religions think alike. As a result, religion needs to be dealt with in its own cultural contexts. Furthermore, if religion is part of the problem, it has to be part of the solution. People will kill for their religion and die for their faith, so only the best of faith can defeat the worst of religion. Finally, young people are radicalizing over the Internet. The United States must begin to learn how to prevent this online radicalization.

Dr. Seiple spoke about the good and bad news about were the USG currently stands with respect to religious engagement. The good news is that the USG is actually thinking about religious engagement in a proactive fashion. The bad news is that there is no training. This is especially true in the interagency. The USG must start thinking about religious engagement more seriously—80% of the people who walk the planet believe in religion.

Dr. Seiple then spoke about the types of models we should think about for religious engagement going forward. Dr. Seiple is part of a newly created Religion Working Group

that is a network waiting to be mobilized through the new Office of Religious Engagement. There is a portal through the State Department to think about religious engagement. There is a network of people that want to do research on religious engagement. This network needs to be engaged on a public platform.

Ms. Neha Ansari, The Express Tribune of Pakistan, Karachi Pages

Ms. Neha Ansari is a Fulbright Scholar and a senior sub-editor at The Express Tribune, a daily English-language newspaper that is a partnered publication of the International New York Times. She writes on regional security issues, U.S.-Pakistan relations, media freedom and ethics, and religious tolerance. She attained her graduate degree at the Fletcher School of Law and Diplomacy, Tufts University. Her concentrations were International Security and Southwest Asia and Islamic Civilization. Prior to Fletcher, she completed her Bachelor's and Master's from the University of Karachi, Pakistan, and won the best student award in both the programs.

Ms. Ansari spoke about religious engagement from a Pakistani perspective. She noted that religious engagement is a precarious topic in Pakistan at the moment.

From the Pakistani perspective, there were two 9/11s. The first was the attack on the American homeland. The second, which occurred a few days following 9/11, was an attack on Muslims and a war against Islam. Most Pakistanis believe that the country was coerced into an alliance with the United States and forced to wage war on its friendly neighbor, Afghanistan. What happened next? Pakistan witnessed, for the first time, suicide bombings and terrorist attacks. Since 2001, 51,000 Pakistani civilians have been killed. The Pakistani populace's narrative is that this is the fault of the United States—popular sentiment in Pakistan consistently blames the United States. Pakistan has paid a heavy price in this war. Moreover, Pakistan is now at the center of another conflict that is an offshoot of this war—the Pakistan Taliban.

Since the 1970s, there have been two catalysts for this anti-American transformation in Pakistan. The first was Zia-ul-Haq's Islamization policies of the 1970s. The second catalyst was the United States-led Afghanistan invasion in 2001. Hundreds of Pakistani jihadis crossed the border to help their brothers in Afghanistan in response to this invasion.

This entire anti-U.S. narrative has been reinforced by what has happened in Iraq and Afghanistan, with U.S. tensions with Iran, and by the belief that the United States has an agenda of interfering with Muslim countries to destabilize and destroy them. Most Pakistanis believe this narrative. This popular anti-American sentiment brought the mullahs to power. These leaders now indirectly support the Pakistan Taliban. Why? Because Pakistan is fighting America's war.

This anti-American sentiment creates problems for U.S. religious engagement in Pakistan. As soon as Pakistanis find out that the United States supports a religious leader, the religious leader's reputation is ruined and his legitimacy is eliminated. Even his life could be in danger. So, what is the solution? The United States must realize that publicly investing in

these religious leaders is a problem because what they teach ends up becoming viewed as American propaganda. The United States needs to ensure that the objective of its religious engagement in Pakistan is more than simply trying to make the United States look like the good guys. U.S. religious engagement needs to have the objective of conflict transformation, conflict resolution, and peace building. Beyond this objective, everything else fails.

Additionally, religious engagement is only efficacious if the effort is indigenous. You need to speak their language and listen to their grievances and concerns. For example, in Pakistan, one cannot say that a certain religious practice is against human rights. Religious leaders would say, "Those are Western principles of human rights, not our Islamic principles and traditions." Their understanding of human rights is much different than that of America's understanding.

The United States must invest in institutions that can produce leaders for the long-term who are indigenous, powerful voices that can challenge extremist pro-Wahabi narrative. The US must invest in religious educational institutions that do not teach faith but teach *about* faith. Additionally, U.S. investment does not have to be done openly. U.S. engagement has to be done with the United States taking a back seat and letting the local leaders guide the engagement. If this is not carried out, any religious engagement will be seen as religious interference.

Discussion

During the Cold War the U.S. was very good at countering ideologies—mainly Communism at the time. What is the U.S. doing in response to the fact that pro-Wahhabi ideologies have had a counter influence on the Islamist world?

Mr. Hussain responded that the U.S. Special Envoy to the OIC is in regular communication with governments, civil society, and others in multiple forums regarding the export of harmful ideologies. These countries need to do a better job of addressing educational problems, with respect to both religious education and secular education, which often create climates that allow harmful ideologies to spread. When literacy rates are low, violent extremists and others are able to exploit youth and others in promoting their ideology and advancing their agendas.

The OIC has a declaration on human rights in which article 24 states that all human rights are specified to Sharia Law. This ambiguity could lead to problems. Has the United States ever sought clarification on this ambiguity?

Mr. Hussain responded that the U.S. often engages with countries and actors with which it has policy disagreements and responds by consistently emphasizing the importance of protecting the human rights of all, including women and minorities. He noted that sometimes individual OIC members advance provisions that even the OIC's Secretariat disagrees with and he has engaged these countries directly as well. Under the current Secretary General, the OIC has been on a trajectory different from the prior OIC trajectory.

One example of this is that OIC had previously supported a resolution of defamation of religion. The U.S. viewed the previous resolution as inconsistent with free speech and as a mechanism for persecuting religious minorities. So the U.S. Special Envoy to the OIC worked with the OIC to eliminate both the defamation concept and restrictions on speech inconsistent with U.S. law. Another area that the he has been working on with religious leaders is a project for the protection of religious minorities in Muslim majority countries. In the area of countering violent extremism, the U.S. Special Envoy to the OIC has worked with the OIC on its efforts to condemn terrorism and attacks on minorities in places such as Pakistan, Egypt, Nigeria, and Iraq.

Hans Kuhn is a Swiss theologian who has written on the importance of a global ethic (shared values across the world religions). It seems that a common global ethic could form the foundation for religious engagement. This global ethic could provide a common baseline for engaging religious leaders. Is there any ongoing work to create such a common global ethic and, if not, how might the U.S. be able to promote a common global ethic?

Ms. Ansari noted that she is a believer in creating a common global ethic. However, she noted that this is a minority perspective. Many powerful religious leaders are not tolerant to the idea of a common global ethic and ideas like global sharing, which they often consider to be infiltration. A lot of work needs to be done in removing this roadblock to even begin to approach global shared values. There is a lot of potential with the idea of a common global ethic, but this is not the solution right now—it would be a long-term goal. To remove the roadblock would require investment in institutions and education. Investing in education is crucial. The media would also play a critical role in potentially creating a common global ethic.

Dr. Seiple added that on one hand we should try to figure out what a common baseline is with respect to religion, however, on the other hand, we have to allow for the irreconcilable theological differences. Sometimes when the words “collective” or “common” are used with religion, they are interpreted in the wrong way.

Panel Two: Megatrends and Implications for DoD (Moderator: Mr. Dan Flynn, DNI/NIC)

This panel discussed four significant trends likely to emerge in the next 15 years, namely demographic change, resource stress, further diffusion of power, and individual empowerment. The implications of these and other megatrends will be discussed and their implications to national security will be explored.

Panel Members:

- Dr. Richard Cincotta, Stimson Center for Demographics
- Major Gen. (ret) Richard Engel at the NIC for Energy and Natural Resources
- Dr. Jacqueline Deal from the Long Term Strategy Group on the Diffusion of Power

- Dr. T.X. Hammes from NDU for Individual Empowerment

The panel was moderated by Mr. Dan Flynn, DNI/NIC. *Mr. Flynn is the Director of the Global Security Program for the National Intelligence Council's Strategic Futures Group. In this position, he is responsible for leading national-level, interagency projects to provide senior U.S. policymakers, defense officials, and warfighters assessments of long-term and crosscutting military-security issues of strategic importance to U.S. security interests. In this capacity, he is also responsible for leading the National Intelligence Council's strategic analytic gaming efforts to assess emerging national security issues. He has worked closely with the Office of the Secretary of Defense, the Joint Staff, and the Combatant Commands in support of U.S. military strategy development and planning efforts. He has also served as an advisor to several Defense Science Board studies.*

Mr. Flynn explained that the megatrends discussed at the conference refer to the NIC's report on global trends, which is published every four years.[2] Global Trends 2030 is intended to stimulate thinking about the rapid and vast geopolitical changes characterizing the world today and possible global trajectories over the next 15 years. As with the NIC's previous Global Trends reports, it does not seek to predict the future, but instead provides a framework for thinking about possible futures and their implications. The Global Trends report frames the strategic context in which policy makers must make choices. The four trends include:

- diffusion of power in the international system (state and nonstate);
- demographics;
- growing nexus between food, water, energy, and climate change; and
- individual empowerment.

Dr. Jacqueline Deal, Long Term Strategy Group

Dr. Jacqueline N. Deal is President and Chief Executive Officer of the Long Term Strategy Group (LTSG), a Washington, DC-based defense research firm founded in 2006. For most of the last decade, she has supported the Office of the Secretary of Defense, the National Intelligence Council, and other U.S. government and military sponsors on projects related to Chinese defense modernization and international relations in East, South, and West Asia. Recent studies and briefings that she has authored or co-authored have analyzed China's approach to the information technology "revolution in military affairs" (RMA); the military balance between China and India; future conflict scenarios in the South China Sea and Indian Ocean regions; China-Iran relations; military nationalism within the Chinese People's Liberation Army; and China's capacity for generating radical technological innovations.

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[2] National Intelligence Council. (2012). Global Trends 2030: Alternative Worlds. Retried from http://www.dni.gov/index.php/about/organization/national-intelligence-council-global-trends

Dr. Deal stated that a megatrend highlighted in the Global Trends 2030 report is the "Diffusion of Power," and that is the subject that Dan invited me to discuss with you today. There are two headlines from the report on the diffusion of power:

- "By 2030, Asia will have surpassed North America and Europe combined in terms of global power, based upon GDP, population size, military spending, and technological investment." The report also notes, "the economies of Europe, Japan, and Russia are likely to continue their slow relative declines."
- The second point is perhaps more qualitative. According to the report, "By 2030, no country … will be a hegemonic power. Power will shift to networks and coalitions in a multipolar world." Therefore, we are potentially looking at a change in the nature of power in the international system.

Let me begin by trying to define or more precisely specify and unpack what we may be observing with respect to both power shifts on the one hand and the diffusion of power on the other. One could ask, what do we mean by power? And, which aspects of it are spreading (i.e., diffusing) versus shifting (i.e., sprouting up in new places)? At what pace, or at least, what is the sequencing? Therefore, we will start with a closer look at what is and is not going on with respect to changes in the balance and nature of power. And by necessity, I will spend most of the ten minutes allotted to me on this set of issues. But second, I will offer some quick speculation about where the observable trends may head in the future.

Finally, I know that everyone here will appreciate the importance of trying to consider these trends not only from a US perspective but also from the perspective of other global actors. So I will conclude with a brief discussion of how the "Diffusion of Power" megatrend might be observed in other parts of the world and the potential implications for the U.S. Department of Defense.

Turning first to definitions and more specific observations… the main contributor to the Global Trends report's first headline on the rise of Asia is China's GDP growth, which is largely a function of changes within China – i.e., more efficient use of China's human capital. By moving Chinese workers from the countryside into the cities, and directing their labor from relatively less productive agricultural tasks to more productive manufactures of low-cost consumer goods for export, China has been able to grow very rapidly over the past few decades. Not to be pedantic, but this is not actually an example of power diffusing, or spreading, from the developed West and Japan to China. Rather it is an example of a power shift. China's economy has grown very rapidly in the same period as the economies of Europe, Russia, and Japan, for demographic reasons as well as because of domestic policies, have been growing much more slowly. So if China's economic rise is an example of a power shift, what kinds of, or attributes of, power actually are diffusing, or spreading internationally?

Here I think the most important trend concerns migration, which is mentioned in the report under the "Demographic" megatrend heading. I am specifically thinking of the diffusion of knowledge – in the high-tech sphere, around engineering, etc. Many would point to the role

of the Internet in facilitating the diffusion of knowledge. But developing countries used to worry about "brain drain," the phenomenon whereby talented young people left to pursue their higher education and their careers abroad. Now, however, it may be the case that because of economic growth, opportunities in developing countries have improved such that those who study overseas return to pursue their careers in their countries of origin. With rising economic growth, moreover, local educational institutions have improved, with institutions of higher learning succeeding in recruiting talented professors and researchers.

The diffusion of knowledge has proven to be a key prerequisite for the diffusion of other important attributes of power, including dual-use and military technologies. Put simply, this means that developing countries can now use the technology and information that they extract (i.e., steal/exfiltrate) or purchase from the West. Together with the shift in economic power toward relatively faster-growing Asian countries like China, the diffusion of knowledge has created a situation where not only can new actors buy important platforms – e.g., aircraft carriers – but also once they have them they can use them. And though I just mentioned aircraft carriers, the most important area where we can observe this phenomenon is probably not directly in the military sphere but rather in the dual-use world. Asia has long been a center of chip fabrication. Now it is becoming a leader in information technology writ large. This knowledge base can be used for civilian purposes, e.g., in the communications field. But it can also be used for developing precision-guided weapons and the ISR complexes that support them. So this explains the eager interest of a certain rising East Asian power in dual-use technologies, which, as a matter of fact, China identified back in the 1990s as a potential game-changer in terms of the global military balance of power.

Also on the security side, we can observe that nuclear weapons are not dual use, but they have been around for quite a while at this point. So that means that the technologies and know-how underlying them have had time to spread, in part through the migration of talented workers that we just discussed. For instance, as you all know AQ Khan picked up his nuclear savvy when he was a postdoc at a Dutch/German/British consortium called the Urenco Group in the Netherlands. Specifically, he learned how to make centrifuges while serving as a senior scientist at Urenco in the 1970s. Will there be further proliferation along these lines?

Let me take a moment to address the Global Trends report's second major observation related to the diffusion of power – the more qualitative contention that hegemony is disappearing, and that states will lose importance or influence relative to networks and coalitions. This is tied to a claim about the rise of multipolarity. As a matter of fact, the fraction of global GDP controlled by the United States has remained fairly constant – about 25 percent – for the last forty years. It is true that China and India's shares have risen, but that has been in the context of the relative declines of Europe, Russia, and Japan. So is the world witnessing the rise of multipolarity? Or, as ever, are there (still) a few big powers that account for the lion's share of global economic production?

What about the nature of power itself? In the context of its discussion of the diffusion of power, the Global Trends 2030 report offered a warning to great powers that they may not be able to "punch their weight" if they don't learn how to operate in networks and coalitions. This raises some questions about whether individual states will be able to exert influence in 2030, and also about the importance and role of alliances or networks and coalitions. What I can observe is that the Cold War ideological structure around alliances has clearly broken down, which may make today's alignments less fixed. But then again, even in the Cold War, there was some fluidity to alliance structures. And with regard to the ability of great powers to exert influence, we can point to many influence failures on the part of the United States in the past without concluding that the United States was powerless. So unfortunately, I am not entirely certain about the inferences we can draw about the nature of power in the 2030 decade. Let me now turn briefly to where the observable trends with regard to the spread of power may be headed, and my focus will be on those with military relevance. Having covered dual-use information technology and nuclear weapons, I would like to draw people's attention to the rapidly advancing world of biotech, another area full of potential dual-use capabilities and applications. Some experts have discussed the potential for a cognitive arms race to emerge involving countries with, relative to the United States, perhaps fewer inhibitions or scruples around human subjects research. So that is one thought about a new way in which the spread of knowledge may affect the balance of military power in the coming decades.

Finally, I will close with some thoughts about non-US perspectives on the issues we have been addressing, as well as implications for the Department of Defense. While the draft version of the Global Trends 2030 report was submitted to representatives of other countries for their comments, the report largely reflects an American, or cosmopolitan Western, perspective. As we discussed last year on this panel at this conference, however, much of the rest of the world does not share the developed West's cosmopolitan outlook.

By contrast, in other quarters, particularly in rising Asia, nationalism is on the rise. This is a debatable proposition with regard to India, where the nationalist BJP has been increasing its footprint, but it seems undeniable where South Korea, Japan, and most of all China are concerned. From Beijing's point of view, the rise of multipolarity and the end of hegemony does not mean what we think they mean, or, not only what we think they mean. For China, this is not just about the rise of new powers in Asia and the relative decline of Europe and Japan, but rather, this is about the demise of the United States. For many nationalist Chinese political and military elites, it is time for the rest of the world to start adjusting to China's preferences with regard to a whole host of issues, from border and territory disputes to the handling of so-called rogue regimes, from Syria and Iran to North Korea.

To the extent that the United States and other liberal democratic states continue to have a different agenda with respect to these sets of issues – e.g., our commitment to freedom of navigation and the peaceful resolution of international disputes, along with our opposition to regimes that deny basic human rights to their peoples – then we have to anticipate increasing tension or competition, at the very least, with China. As China's military

capabilities expand as a result of the state's increased economic capacity, there will be pressure on the US military to respond in ways that reassure allies and reinforce stability by denying nationalists in Beijing the opportunity for quick victories.

Major Gen. (ret) Richard Engel, NIC

Maj. Gen. Engel accepted a position as the Director of the NIC's Strategic Futures Group Environment and Natural Resources program in September 2008. Prior to that, he served as the Deputy National Intelligence Officer for Science and Technology and Economics. From August 2000 to September 2004, he was a Senior Analyst with the Strategic Assessments Group of the Office of Transnational issues of the Central Intelligence Agency. Previously General Engel was Commandant of the Industrial College of the Armed Forces, National Defense University, Fort Lesley J. McNair, Washington, D.C. Prior to that, the general was the commander of the Air Force Flight Test Center, Edwards Air Force Base, Calif. General Engel was commissioned through the Reserve Officer Training Corps program at Texas A&M University graduating with a Bachelor of Science degree in mechanical engineering. He has a Master of Science degree from Arizona State University in industrial and systems management engineering and a Masters of Arts degree in national security strategic studies from the Naval War College. While in the Air Force, he was an experimental test pilot and accumulated more than 4,000 flying hours, and flew over 30 different aircraft.

Maj. Gen. Engel stated that competition and scarcity involving natural resources—food, water, minerals, and energy—are increasingly emerging security threats. Many countries important to the United States are vulnerable to natural resource shocks that degrade economic development, frustrate attempts to democratize, raise the risk of regime-threatening instability, and aggravate regional tensions. Extreme weather events (floods, droughts, heat waves) will increasingly disrupt food and energy markets, exacerbating state weakness, forcing human migrations, and triggering riots, civil disobedience, and vandalism. Criminal or terrorist elements can exploit any of these weaknesses to conduct illicit activity and/or recruitment and training. Social disruptions are magnified in growing urban areas where information technology transmits grievances to larger—often youthful and unemployed—audiences, and relatively "small" events can generate significant effects across regions or the world.

Food

Food is a necessity for human life and a valuable economic commodity. Natural food-supply disruptions, such as floods, droughts, heat waves, and diseases, as well as policy choices, probably will stress the global food system in the immediate term, resulting in sustained volatility in global food prices. Policy choices can include export bans; diversions of arable lands for other uses, such as urban development; and foreign land leases and acquisitions. Many resource-strapped countries have been losing confidence in the global marketplace to supply vital resources, and increasingly looking to shield their populations in ways that will almost certainly threaten global food production. For example, emerging powers and Gulf

States are buying up arable and grazing land around the world as hedges against growing domestic demand and strained resources. Food supplies are also at risk from plant diseases that affect grain and oilseed crops and from transmittable animal diseases, such as H5N1 and foot and mouth disease. At the same time, agricultural inputs—water, fertilizer, land, and fuel oil—are becoming more scarce and/or costly, exacerbating the upward pressure on food prices. Growing populations and increased economic development result in different food consumption patterns increasing the stress on food supplies.

While these stresses are unlikely to impact the United States directly, they are likely to impact US economic or military partners, or destabilize countries or regions that are important to US security interests. The lack of adequate food will be a destabilizing factor in selected states in Africa, South Asia, and the Middle East that do not have the natural, financial, or technical ability to solve their internal food security problems. During the 2008 food-price spike at least 61 countries experienced unrest because of price inflation, in 38 of these countries protests were often violent. Household expenditures for food are over 20 percent in India and China; 35 percent in Egypt, Vietnam, Nigeria; 45 percent in Algeria, Pakistan, Azerbaijan, but less than 15 percent in the United States, Germany, and Japan. Markets for agricultural commodities will remain tight. Among grains, corn is likely to demonstrate the strongest international price rises, perhaps 20 percent in real prices in less than ten years.

Some research suggests the rising demand for biofuels and animal feed exerts particular pressures on corn prices, and extreme weather will cause episodic deficits in production. We will also see growing demand and high price volatility for wheat. Significant wheat production occurs in water-stressed and climate-vulnerable regions in Asia, where markets will remain susceptible to harvest shocks. A near-term supply disruption could result when a plant disease known as Ug99 stem rust—already spreading across Africa, Asia, and the Middle East—arrives in South Asia, which is likely to happen within the next few years. Wheat production is growing in Eastern Europe, but output is variable, and governments have demonstrated a readiness to impose export controls. Global meat production must rise from approximately 200 million tons today to 400 million tons to accommodate increasing demand by 2040. By 2030 agriculture will increase water demand by 45 percent. The continuing depletion of groundwater supplies in some countries—owing to poor management—will pose a risk to both national and global food markets. Selected countries in Asia, North America, the Middle East, and Africa have begun to deplete their groundwater to satisfy growing food demand.

Although food-related state-on-state conflict is unlikely in the near term, the risk of conflict between farmers and livestock owners—often in separate states—will increase as population growth and crop expansion infringe on livestock grazing areas, especially in Sub-Saharan Africa and Central Asia. Disputes over fisheries are also likely to increase as water scarcity emerges in major river basins, and marine fisheries are depleted. Shrinking marine fisheries—for example, in the South China Sea—will lead to diplomatic disputes as fishermen are forced to travel further from shore. In addition, government grants of state-

owned land to domestic and foreign agricultural developers are likely to stoke conflict in areas without well-defined land ownership laws and regulations. Terrorists, militants, and international crime organizations will increasingly use declining local food security as an influential or leverage point to promote their own efforts to gain legitimacy and undermine government authority.

Growing food insecurity in weakly governed countries could lead to political violence and provide opportunities for existing insurgent groups to capitalize on poor conditions, exploit international food aid, and discredit governments for their inability to address basic needs. In addition, a potential, intentional introduction of a livestock or plant disease might be a greater threat to the United States and the global food system than a direct attack on food supplies intended to kill humans.

Water

Water is a necessity for human life and economic development. Growing populations place increase stress on finite water availability. Where that stress cannot be managed, the result can be local or even state-on-state tensions and conflict. These stresses can impact the United States, US economic or military partners, or destabilize countries or regions that are important to US security interests. Approximately 97.5 percent of the earth's water is in oceans. Thirty percent of the 2.5 percent that is fresh water is in ground water and only .4 percent of fresh water is on the surface or in the atmosphere. Globally, 68 percent of freshwater used is for agriculture but the usage varies considerably between countries. Electrical power generation uses 13 percent of the fresh water used.

Risks to water supplies—due to shortages, poor quality, and floods—are growing and will hinder the ability of key countries to produce food and generate energy, undermining global food markets and hobbling economic growth. Water problems when combined with other problems – poverty, governance, etc. – can contribute to social and political tensions and disruptions. In the next ten years

- The lack of adequate water will be a destabilizing factor in North Africa, South Asia, and the Middle East.
- Major developing countries will experience water related social disruption, but can address their problems without state failure. Water shortages and pollution will almost certainly harm the economic performance of important US trading partners.

Some states are further stressed by heavy dependence on river water controlled by upstream nations with unresolved water-sharing issues. Historically, water tensions have led to more water-sharing agreements than violent conflicts. However, where water-sharing agreements are ignored, or when infrastructure development—for electric power generation or agriculture—is seen as a threat to water resources, states tend to exert leverage over their neighbors to preserve their water interests. This leverage has been

applied in international forums and has included pressuring investors, nongovernmental organizations, and donor countries to support or halt water infrastructure projects. In addition, some nonstate terrorists or extremists will almost certainly target vulnerable water infrastructure to achieve their objectives and continue to use water-related grievances as recruitment and fundraising tools.

Many countries are using groundwater faster than aquifers can replenish in order to satisfy food demand. In the long term, without mitigation actions (drip irrigation, reduction of distortive electricity-for-water pump subsidies, access to new agricultural technology, and better food distribution networks), exhaustion of groundwater sources will cause food demand to be satisfied through increasingly stressed global markets.

Water shortages and pollution will also harm the economic performance of important US trading partners. Economic output will suffer if countries do not have sufficient clean water supplies to generate electrical power or to maintain and expand manufacturing and resource extraction. In some countries, water shortages are already having an impact on power generation, and frequent droughts are undermining long-term plans to increase hydropower capacity.

Minerals: China's Monopoly on Rare Earth Elements

Rare earth elements (REE) are essential to civilian and military technologies and to the 21st century global economy, including development of green technologies and advanced defense systems. China holds a commanding monopoly over world REE supplies, controlling about 95 percent of mined production and refining. China's dominance and policies on pricing and exports are leading other countries to pursue mitigation strategies, but those strategies probably will have only limited impact for at least five years and will almost certainly not end Chinese REE dominance. In addition, REE prices are below their mid-2011 record-highs—a spike caused by the 40-percent export quota cut that China enacted in July 2010. However, as of early December 2012 prices were at least 80-percent, and as much as 600-percent (depending on the type of REE), above pre-July 2010 levels.

Mines in Australia, Brazil, Canada, Malawi, the United States, and Vietnam are expected to be operational in less than five years. However, even as production at non-Chinese mines comes online, initial REE processing outside of China will remain limited because of technical difficulties, regulatory hurdles, and capital costs associated with the startup of new or dormant processing capabilities and facilities. China will also continue to dominate production of the most scarce and expensive REEs, known as heavy REEs, which are critical to defense systems.

Energy

Oil prices will remain highly sensitive to political instability in the Middle East, tensions with Iran, and global economic growth. In 2012 increasing US, Iraqi, and Libyan output, combined with slow economic growth, helped ease upward pressure on prices. In the

coming year, most growth in new production probably will come from North America and Iraq, while production from some major producers will stagnate or decline because of policies that discourage investment.

US energy production has been transformed by shale gas and tight oil technological breakthroughs achieved in the last decade this will almost certainly have positive impacts on US energy production, greenhouse gas emissions, and US global economic competitiveness. Sustained oil prices above $80/barrel would help support growth in North American output. Annual shale gas production in the United States grew from 1.6 trillion cubic feet in 2007 to 7.2 trillion cubic feet in 2011. Shale gas production accounts for approximately 20 percent of total US gas production but is expected to make up 49 percent by 2035 according to the Energy Information Administration. The United States currently produces about 700K barrels per day of tight oil, but a 2011 report from the National Petroleum Council suggest tight oil production could read 2-3 million barrels per day by 2035. As with natural gas, estimates for US production are a moving target.

There will potential winners from this technology to include present gas importers and potential losers to include gas exporters. However, in the near-term, natural gas prices will remain regionally based, with North American consumers probably paying one-third the price of European importers and one-fourth that of Asian consumers. With the prospect of US and other new liquefied natural gas (LNG) exports, major European and Asian importers probably will continue to pressure their suppliers to de-link their prices from oil. Weather, economic indicators, and energy policies in Japan probably will have the strongest influence on global LNG prices. Australia is poised to become a top LNG exporter but faces project cost inflation that could slow development. Many Organization of the Petroleum Exporting Countries (OPEC) members are increasingly dependent on high oil prices to support government spending. On the flip side, the budgets of countries that subsidize domestic fuel consumption will come under greater stress with high oil prices and rising domestic demand.

Climate Change

Climate change is one of the long-term factors – along with demographics and technology -- that can impact economic development and well-being of the United States, our trading partners, or military allies. Climate change—to include increased severity and frequency of extreme weather events—influences water availability, food and energy production, or critical infrastructure. Food security has been aggravated partly because the world's land masses are being affected by weather conditions outside of historical norms, including more frequent and extreme floods, droughts, tornadoes, coastal high-water, and heat waves.

Warming temperature, for example, although enhanced in the Arctic, is not solely a high-latitude phenomenon. Recent scientific work shows that temperature anomalies during growing seasons and persistent droughts have hampered agricultural productivity. Relative

to the early 20th century climate norms, over 30 percent of the land surface has within the last decade experienced abnormally warm weather as compared to the expected long-term (1910-1970) average of about 3 percent. Over the past 15 years, cold extremes have become far less frequent. Persistent droughts during the past decade have also diminished flows in the Nile, Tigris-Euphrates, Niger, Amazon, and Mekong river basins. In 2010, a severe drought in south China caused the Mekong River to drop to a 50-year low. The Horn of Africa recently experienced the worst drought eastern Africa has seen in 60 years. In Peru, droughts associated with El Nino events in the 1980s and 1990s spurred increased migration from rural to urban areas.

The total volume of arctic sea ice shrank in the summer of 2012 to the smallest amount ever observed during the age of satellites. The transition to summer season ice-free status is now well underway and could happen within a few decades.

Demographics

Conclude with some words on Demographics. Demographic trends will aggravate the medium- to long-term outlook for resources and energy. Through to 2030, the global population is expected to rise from 7.1 billion to about 8.3 billion. The size of the world's population in the middle class will expand from the current 1 billion to more than 2 billion. The proportion of the world's urban population will grow from 50 percent to about 60 percent.

Conclusion

Competition and scarcity involving natural resources—food, water, minerals, and energy—are increasingly emerging security threats. Many countries important to the United States are vulnerable to natural resource shocks that degrade economic development, frustrate attempts to democratize, raise the risk of regime-threatening instability, and aggravate regional tensions.

Dr. T.X. Hammes, NDU

T. X. Hammes served 30 years in the U.S. Marine Corps to include operations in Somalia and Iraq and trained insurgents in various locations. Hammes earned a Doctor of Philosophy in Modern History from Oxford University and has lectured widely at U.S. and International Staff and War Colleges. He is the author of two books and over 100 articles and opinion pieces.

I was asked to discuss the individual empowerment megatrend. The basic NIC provides an optimistic view of individual empowerment. I am going to offer an alternative, darker view. While many great things will evolve from the empowerment of individuals, it is essential security analysts think carefully about potential downsides. The convergence of multiple trends both empowers individuals and small group and makes him/them much more dangerous. Simply put, advances in technology have brought much greater destructive power to lower levels. Advances in biotechnology are particularly concerning. While currently, human enhancement requires significant resources, the application of synthetic

biology to reproduce or change simply organisms is both inexpensive and widely available. Even high school kids are able to manipulate DNA as evidenced by science fairs and competitions. High school teams are now entering International Genetically Engineered Machine competition with the goal of building biological systems and operating them within cells. University labs are creating organisms with 1M base pairs. There are 200,000 base pairs in smallpox.

A second critical trend is the advent of the 3D printing/additive manufacturing. Over time, this will impact every field of human endeavor. An immediate concern is that individuals can print out drones. College students are creating drones to include quad copters and using them for a wide variety of gamed from tracking other students to bombing competitions. One student has developed live ordnance with proximity fuses. Drones are being used for filming weddings, tracking celebrities, filming moto-cross races, and delivering packages. While these are all short-range endeavors, we need to remember that in 2003, a hobbyist flew a model airplane across the ocean using GPS. If armed, that could be an intercontinental range weapon. If armed with an explosively formed projectile, it can penetrate a wide variety of targets. Creative thinkers will see these as a way to attack individuals or a way to use the drone as the detonator for explosives or fuel stored in the target society. Thus, a small, cheap, long-range, and precise generation of weapons is evolving. They will allow small groups or even individuals to create great devastation.

Technology is amplifying this problem with progress in a different field. Robotics tied to information technology is rapidly progressing to the point where it will be able to replace skilled workers—decimating the middle class. The list of occupations being done by technology is large and growing—customer service and manufacturing are painfully obvious. Even Chinese workers have become too expensive. Foxconn is purchasing 1M robots to replace 500K Chinese assembly line workers. Soon, construction and transportation workers will be replaced.

Previously, we could see how each revolution resulted in a new kind of workforce. The transition from agricultural to industrial to information based societies all created the need for large numbers of workers in the new field. But the entire point of robotics is to replace workers. So it is not clear if the robotics revolution will create jobs. Clearly, the new industries will create great wealth—but that wealth will flow to capital rather than labor. Unfortunately, few societies have learned how to distribute wealth fairly and without destroying the incentives to create wealth. Thus, the convergence of these new technologies may result in vastly increased wealth concentrated among a few individuals. Historically, large wealth gaps have given rise to dissatisfaction from those who do not have access to wealth. So does this mean a larger middle class as projected in the NIC or does it mean a greater division between haves and have nots with have nots potentially increasing in number? What happens with the youth bulge and sex imbalance in what are some of the world's poorest societies?

The convergence of greater destructive power at much lower cost with the rise of an aggrieved class of have nots could be explosive. Just because these young men will have no partners, no opportunities, and no education does not mean they are dumb or will be helpless. We could be creating an angry, connected, and self-educated cohort with the ability to produce cheap, precise, long-range weapons or—much worse—biological weapons.

With that, I will conclude these brief remarks on the potential downside of global trends.

Dr. Richard Cincotta, Stimson Center for Demographics

Dr. Richard Cincotta is the demographer-in-residence at the Stimson Center in Washington, DC, a Wilson Center Global Fellow at the Environmental Change and Security Program of the Woodrow Wilson Center for International Scholars, and a contributor to the National Intelligence Council's strategic foresight efforts. Dr. Cincotta served as the Director of Demographic and Social Science Programs in the National Intelligence Council's Long Range Analysis Unit (2006-09), and was an AAAS Diplomacy Fellow and Public Health Fellow in the Policy and Evaluation Division in USAID's Office of Population and Reproductive Health (1992-96).

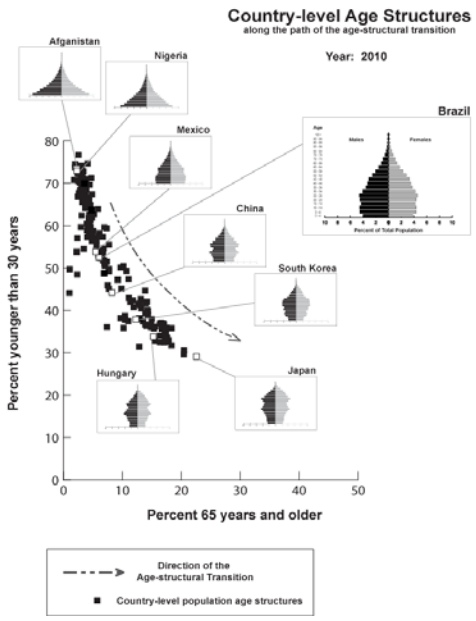

Figure 2. Country-level Age Structure

Dr. Cincotta discussed the intelligence value of demography. He indicated that the field has a great deal to offer the intelligence community because the data—both estimates of the past and projections of the future—and the methodologies on which these data rely, are publically accessible. Dr. Cincotta provided various examples of how age-structural analyses can help analysts understand global political and economics dynamics and be used as a critical element in intelligence "early warning."

Figure 2 shows graphs of age structures in various countries, and the long-term direction of transition. As countries with youthful populations experience fertility decline, their age distribution matures. This process has economic and political implications. Because these data can be projected out 20 years with some certainty, intelligence analysts can anticipate some types of future state behaviors and trends.

Intra-state conflicts tend to be initiated in very youthful countries (less than 25 years of median age). As populations age, states gain a higher probability of attaining stable liberal democracy, and the probability of new intra-state conflict declines markedly. Age-structurally mature autocracies are rare. Those that exist have highly ideological single-

party governments or they tend to be led by charismatic founder figures and game-changers.

Age structure can be used to anticipate regional futures. Most of the East Asian and Latin American countries that were vulnerable to civil conflict in the 1960s to 1980s have undergone fertility decline and matured. These states are now in the most economically vibrant period of their age-structural transition. Over the next 20 years, the world will continue to experience a slow reduction in the number of youthful countries that compose the "demographic arc of instability," particularly in Southeast Asia, the Andes Region, and North and southern Africa. Population aging in Europe and East Asia is likely to affect the global economic system and regional alliances, but because there is no historic record of this demographic effect, its details are difficult to forecast.

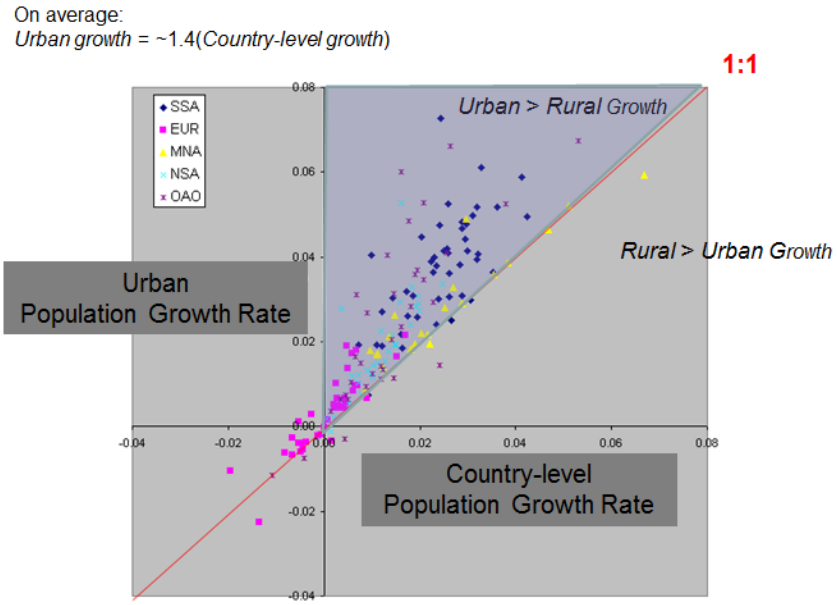

Figure 3. Urbanization Trends

Figure 3 demonstrates that the country-level population growth rate drives the urban growth rate. To demographers, urbanization appears to be a product of population growth, rather than industrialization. Industrial expansion appears to affect the location and distribution of urban settlement, and has weaker effects on urban growth. The conversion from rural to urban livelihoods tends to boost economic growth, in almost every circumstance.

Dr. Cincotta offered three conclusions about urbanization.

1. Where country-level population growth rates are high, so will urban population growth rates. Thus, we can expect, sub-Saharan Africa to continue to urbanize rapidly.

2. Despite significant gains in the urban share in both Asia and sub-Saharan Africa, both regions will continue to lag the others over the next 20 years.
3. Urban theory remains too poorly developed to predict whether political stability or instability will follow urbanization-induced economic growth.

He offered four conclusions related to age structures in 2030.

1. Equatorial sub-Saharan Africa will remain youthful to 2030 and beyond.
2. Most of the currently instable states in the Middle East and South-central Asia (Afghanistan, Iraq, Yemen) are likely to remain youthful to 2030.
3. In the early 2020s, parts of the Maghreb and Central Asia will attain age structures comparable to Tunisia's.
4. During the next two decades, Japan and some European states will attain age structures with exceedingly large proportions of seniors (~30 percent by 2030).

Ultimately, the most relevant finding for the USG is that the ratio between young adults (15 to 29) and mature and middle-aged adults (30 to 64) in some of the world's most instable regions is declining, which tends to statistically herald increased political stability and democracy. However, many of the states in which the US military is or has been recently involved—such as Afghanistan, Iraq, and Yemen—still have high fertility rates and youthful populations.

Discussion

Can you look back in history and draw any lessons learned about shifting power and what that might mean for the United States?

Dr. Deal responded that perhaps the most relevant transition was between the fall of the British Empire and the rise of the United States. The foundation was laid in the growth of the U.S. Navy and the U.S. economy. The transition was relatively peaceful because the United States and British shared a common political tradition, values, etc. A more turbulent transition might be the rivalry between the British and Germans leading up to World War I. What is interesting is that these cases were preceded by a time when the world was more connected than it ever had been. The theory that if we are connected by commerce, we do not have to worry about war has been proven wrong. It does not seem likely that economic interdependence will guarantee peace.

There seems to be a tradeoff between defense spending and prosperity spending. Does the NIC believe that technological investment can mitigate that risk? How do we optimize investment in the DoD that also invests in technological development?

Maj. Gen. Engel responded that investments are only zero sum if you are talking about government-funded investment, but most technology investment is taking place in the private sphere. Food is once exception where technology development has not spread evenly. Most crops in Africa have not been modified to enhance productivity. If that transition did take place, it would go a long way to mitigating food insecurity in Africa. The

water challenge can only be mitigated by making the most of existing technology. These challenges are too big for the United States to take on alone.

You spoke about individual empowerment, but there is increased empowerment of non-state groups and institutions. The role of alliances in distributing power is also changing. What are the potential impacts of these changes? How will it affect global dynamics?

Dr. Deal responded that the impacts have to be studied regionally. It is a global trend, but it is occurring differently in different regions. For example, the empowering effects of technology impact the individual in the west differently than someone in an autocratic country. In the west, trends point to the decreasing power of the state. The United States is vulnerable to a small group of people who want to influence policy (e.g., the Tea Party or the Occupy Wall Street movement). In an autocratic world, the same technology is being used to find dissidents and nip unrest in the bud. Security analysts have suggested that if the USG wanted to, it could focus its efforts on preventing autocracies from using technology in ways that consolidate their power.

Panel Three: What is So Special About the Current Era and "Why"? (Moderator: Mr. Ben Riley, OSD, ASD, R&E/RFD)

This panel will debate the following issues:

- Is there an era in previous history that is analogous to the one we are in now?
- Has any prior era in history, western or global, encountered similar challenges?
- Do these challenges influence the nature of our conflicts and the types of capabilities we will require?
- Can we highlight any unique aspects of the conflicts of that period and the nature of the capabilities that might have been developed in these conflicts?
- Do these previous conflicts and capabilities provide insight to our challenges of today?

Panel Members:

- Dr. Claudio Cioffi-Revilla, GMU
- Dr. Jonathan Wilkenfeld, University of Maryland
- Dr. William Reed, University of Maryland

Mr. Ben Riley, OSD/ASD R&E/RFD, moderated the panel. *Mr. Riley is the Principal Deputy, Deputy Assistant Secretary of Defense, Rapid Fielding in the office of the Assistant Secretary of Defense, Research and Engineering. Mr. Riley is responsible for policy and oversight of fielding capabilities that counter unconventional and time-sensitive threats. He facilitates rapid technology transition within the Department through discovery and demonstration of*

advanced technology concepts and works with interagency and coalition partners, industry, and academia to facilitate the timely satisfaction of validated priority operational needs.

Mr. Riley noted that some research has shown the period from 1815 through World War I to be an analogous period to the current era. This time period had youth social movements, countries rising to power out of nowhere, the first industrial war, and the industrial revolution, among other things. However, though research can explain "what" happened during this time period, it cannot explain *why* it happened.

If one were to substitute the phrase "industrial revolution" with "information revolution," many similarities could be made between the period of 1815 through World War I and the current era. Looking back at the enormity of change that occurred during that prior time period, it would seem that no idea today is too outlandish.

Dr. Claudio Cioffi-Revilla, GMU

Dr. Claudio Cioffi-Revilla is Professor of Computational Social Science, founding Chair of the Computational Social Science Department, and Director of the Mason Center for Social Complexity. His research focuses on quantitative models of conflict, disasters, and complex social systems, with funding from NSF, ONR, and DARPA. He has published seven books and over seventy peer-reviewed publications. He serves at the State Department as Jefferson Science Fellow of the National Academy of Sciences, and as Associate Scientist at the Smithsonian National Museum of Natural History. He is co-founder, past President of the Computational Social Science Society of the Americas. His latest book is entitled Introduction to Computational Social Science: Principles and Applications (Springer-Verlag: in press, 2014). Dr. Cioffi is presently involved with projects aimed at bringing science and technology to bear on fundamental research and applied policy issues related to humanitarian assistance and disaster relief (HA/DR). Aspects of this effort involve advanced data sets, analytical tools, simulation models, and geospatial methodologies aimed at advancing the field of HA/DR science and analytics. Complex crises remain at the center of his research agenda, including operational analysis, methodological tools, and basic research perspectives.

Dr. Cioffi-Revilla stated that the current era is special because it has produced an increasing number of mega-issues. Mega-issues are not simply larger public policy issues; they are significantly different from issues of the past. Many examples of these mega-issues have been discussed as megatrends.

There are two primary mega-issues facing the current era: mega-disasters and megacities. With respect to mega-disasters, humanity has endured disasters for millions of years. So much so that real scientific progress has been made on understanding how disasters occur. However, the mega-scale of these recent disasters is something that needs to be reflected on. These mega-disasters did not occur centuries ago—mega-disasters are new phenomena. Extreme magnitude events have properties that set in motion things that do not occur without thresholds of severity. There are a couple of hazards that are created through technology, which allows civilization to function, but the fact is that there is an increasing potential for large catastrophic disasters. With respect to megacities, for the first time in

thousands of years the majority of the human population lives in urban areas. This is not the first time this type of urbanization has happened—it occurred 7,000-10,000 years ago—but it eventually receded. The rapid urbanization of the current era is on a larger scale than that of the past. Megacities are not simply big cities; they are organically and functionally different from large cities. For any megacity to be viable, it must become smart. This theme of smart cities emerging is extremely important. We are currently entering urbanization phase 2.0 with phase 1.0 being 7,000-10,000 years ago. Mega-disasters and megacities are not simply big issues. They are mega-issues.

Why is this so important? These current mega-issues are challenging because we manage public policy issues through policy and the currently existing policy is not designed to deal with this magnitude of challenge. It is not a matter of insufficient capacity or finance; rather, it is that our current systems, which produce public goods necessary to manage public issues, are insufficient for handling these mega-issues. This problem exists at many levels: local, government, and international.

The way in which we maintain international governance is done in an institutional manner that is based off previous methods. Continuing to take this approach is not a great idea. This is a fundamental problem for governance. We do not know how to design systems of governance to handle mega-issues. As a result, two things are needed: a very systematic and clear assessment of the mega-issues and possible solutions. Institutions need to be designed for handling these mega-issues based off these possible solutions. Ultimately, what is needed is something similar to the Manhattan Project that addresses the fundamental and applied science for addressing mega-issues. Many gaps exist and, unfortunately, solutions cannot be created with these gaps in place.

Mr. Riley noted that with respect to comprehensive assessment and the inability of U.S. policies to keep up with change, a RAND study found that Congress has been rather good at keeping up with change but that the DoD needs work, especially concerning information sharing. Some fundamental information sharing policies are based off policy written in 1988. A lot has changed since 1988, so the policy should probably be updated.

Dr. Jonathan Wilkenfeld, University of Maryland

Jonathan Wilkenfeld is Professor and prior Chair of Government and Politics at the University of Maryland and Director of the ICONS simulation project. He is an Affiliate Faculty in the UM Institute for Advanced Computer Systems. He is a specialist in foreign policy decision-making, crisis behavior, and mediation, as well as in the use of simulation in political science. Since 1977, Wilkenfeld has served as co-Director (with Michael Brecher) of the International Crisis Behavior Project, a cross-national study of international crises in the twentieth century. The project has served as the basis for systematic research into a range of crucial foreign-policy issues, including state motivations during times of crisis, conflict management practices, and protracted conflict trajectories.

Dr. Wilkenfeld discussed whether there is an era in previous history that is analogous to the one of today. Dr. Wilkenfeld touched upon three themes: the structure of the international system and implications for peace and stability, evolving power relations between the United States and China in the context of theories of power transitions, and the array of current critical global issues and the prospects for collective action in addressing them. Furthermore, Dr. Wilkenfeld concluded that while there are some unique twists, there is no dramatic change toward a unique system structure, a heretofore-unseen relationship among the powers, or a particularly unusual justification for collective action.

The structure of the international system and implications for peace and stability. When thinking about the current era, it is important to define what the parameters of the current era are. System theorists look to system structure or polarity as a way of differentiating among historical international systems. This is because the nature of the system, and the place of a particular nation in it, dictates the opportunities and constraints on its behavior in the system. Generally, the distribution of capabilities is among the key actors in the system, often identifying autonomous power centers. Most theorists argue that the 20th century was multipolar between the two world wars. That is, a system with several relatively equal power and decision centers, flexible non-ideological alliances, and balance of power politics. The bipolar system existed from the end of World War II to the collapse of the Soviet bloc in 1989. Some refer to this period as a tight and loose bipolar system. Bipolarity represents two relatively equal major powers acting as power and decision centers, i.e., two superpowers or hegemons, and inflexible ideology-based alliances. Toward the end of the bipolar era, loose bipolarity was typified by the emergence of multiple decision centers (other than military).

The collapse of the USSR and the Soviet bloc moved the system from power bipolarity to power unipolarity in the form of clear U.S. military primacy. The first evidence of this on a global scale was the coalition actions in both the Iraq-Kuwait crisis of 1991 and the Balkans 1992-95. That is, it was relatively straightforward to put together alliances to deal with these crises. The key to what we might call tight unipolarity was that the single hegemonic power was able to call the shots, more or less. This is now in the process of evolving.

International Relations theorist Michael Brecher has defined the current international system, still evolving in search of an equilibrium, as power unipolarity and decisional multicentrism—with U.S. dominant military power but many autonomous decision centers constraining the exercise of U.S. hegemony. The difficulty of putting a coalition together for the Gulf War of 2003, as compared to the action against Iraq in 1991 regarding Kuwait, is illustrative. There are real constraints on power in the current system, for example, U.S. negotiations with Iran, North Korea, and China.

Interestingly, there is little discussion in the literature of international relations today on the demise of the nation state, which is still defined in terms of territoriality and sovereignty. The demise was forecasted at the end of World War II, but if anything, the national state concept has strengthened. However, there are many changes. Some multinational corporations generate more economic activity than some smaller states. Some

U.S. States, for example California, have their own foreign policies, mostly but not exclusively in the economic realm—the same is happening in Germany. Therefore, while the nation-state system remains in place, it is evolving.

While a unipolar system is not a frequent occurrence in the contemporary international system, the current system shares enough features with other polar structures so that much of intestate behavior, and conflict behavior in particular, remains within the realm of what we have come to expect of the system. There is a strong possibility that the system will evolve from unipolarity to bipolarity with the rise of China, at least as a regional power.

Dr. Wilkenfeld spoke about evolving power relations between the United States and China in the context of theories of power transitions. Theory on hegemonic power transitions argues that challenger states initiate war when they reach a level approaching the power of the dominant power. Is this the case in the current era, with the United States and the challenger being China? Or is China's challenge more regional in nature, serious nevertheless to U.S. interests, but different than a global challenge to the power of the hegemonic state. What can be learned from other historical periods in which power challenges have taken place? It is safe to say that the current era, insofar as power challenge is concerned, is again not particularly unique as a historical phenomenon. That is not to say that China's increasingly aggressive behavior in the East China Sea should not be taken seriously. But it needs to be viewed within the context of inevitable shifts in power relations among dominant powers in the system.

Is the current era unique in that many of the critical issues are now being defined on a global scale and, therefore, addressable only through some sort of collective action? Certainly, the creation of the League of Nations after World War I and the United Nations after World War II were collective actions undertaken to end world wars. On an ideological basis, portions of the world came together collectively to address the threat of Nazism and then later Communism. Furthermore, progress has been made in collectively addressing the scourge of nuclear weapons in an attempt to limit their spread. However, there is nevertheless something of a unique feeling about the array of global issues of today—climate change, global financial crisis, ethnic diversity, underdevelopment, democratization/regime stability, conflict management/resolution—that seems to require a collective action framework.

During the more than two decades since the collapse of the USSR and the Soviet bloc, there has been a dramatic change in the nature of conflict in the international system—from nation-on-nation to subnational. Projection of force in the normal sense has little impact on this latter type of conflict that has come to dominate the current system. Additionally, the conflicts are different—conflict recurrence is perhaps the most critical. Whereas the United States was once able, with obvious exceptions, to leverage collective action, mediation, etc. to address conflicts and to move from conflict management to conflict resolution, that is not happening with subnational conflict. What worked before does not work as well in the current conflict context.

Climate change is an issue that must be addressed through collective action. Very little doubt remains that human activity is now the primary cause of at least 50% of pollutants contributing to global warming, which is projected to result in a two degree Centigrade rise in temperature and about six inch rise in sea level by the end of the century. These trends cannot be reversed without collective action. There are many other issues that have a similar feel to them to some extent—human made with a requirement for collective action. This may very well allow us to draw the conclusion that our era is in fact unique. There is something of a perfect storm of issues in need of collective action with divisions and impediments to collective action cutting across the issues in different ways.

Ultimately, it does not seem that the current era is overly unique. While there are some unique twists, there is no dramatic change toward a unique system structure, a heretofore-unseen relationship among the powers, or a particularly unusual justification for collective action. For system polarity and power transition, there seems to be a movement back toward a type of balance of power, not immediately, but moving in that direction. Regarding global issues, while we seem burdened by a number of simultaneously critical problems, even the argument that climate change is a unique outgrowth of human activity, there are sufficient historical parallels, particular regarding nuclear weapons, that we cannot draw the uniqueness conclusion.

Dr. William Reed, University of Maryland

William Reed is an associate professor in the Department of Government and Politics and a research fellow in the Center for International Development and Conflict Management (CIDCM) at the University of Maryland. His research interests include mathematical and statistical models of international conflict and cooperation, civil war, Asian security politics, disputes over natural resources/territory, and experimental studies of conflict bargaining. His teaching interests are in Theories of International Relations, Mathematical Models of International Politics, Applied Econometrics, Politics of the United Nations, and Security Issues in Asia. Education: Ph.D. Political Science, Florida State University, M.S. Political Science, Florida State University, B.A. Sociology, Emory University.

Dr. Reed talked about what it means to compare different eras. There are many reasons to think that the current era is different and unique. Interstate conflict is lower, intrastate conflict is higher, and there is a high risk of international conflict. However, analysts are typically biased to view the current era as different because they are living it.

To compare eras one must first define the eras. One way to define an era is to think about it as counting time. The problem with this is that it is an ad hoc way of defining time frames for eras. What might be learned from dividing time into specific length years will likely be misleading. As a result, people tend to define eras by events. This approach has a lot of face validity because it is possible to see variables shifting after major events. Although one challenge that exists is that it is not always clear if these variables are causing the major events to occur. For example, was it the trend in democracy that caused world war or was it the war that caused the trend in democracy? Another challenge with defining eras by events

is that there is a lot of regional variation. For example, 9/11 was viewed much differently in the United States than it was in Pakistan. The views that westerners use to define an era might be much different across other regions in the world. The views of an era are not homogenous across regions. Depending on status and geo-location, these era markers may be quite different.

The current era might be unique because the distribution of observable measures is different and the way states, actors, groups, etc. respond to changes in the distribution of variables is different.

It is also important to consider random error. Many historical events have occurred that can be attributed somewhat just to chance, at least in terms of the outcome. If an event like 9/11 did not happen would this era be different? Are these critical events needed to separate eras?

We must be careful when trying to compare different eras in different times. Analysts today are likely biased in thinking that the current era is unique because they are living in it. This era may be unique, but it is not clear.

Discussion

From a DoD perspective, what does resiliency mean with respect to megatrends and dynamic forces?

Mr. Riley responded that from a research and engineering perspective, there is a need to select critical investment areas from trends that have been observed and steadily invest in these areas rather than simply reacting to the newest, latest thing. A lot of money has been invested into the socio-cultural areas of research and if for some reason this investment is suddenly stopped, a situation may arise in the future where there is a need for this work that no longer exists because investment was previously ended.

Is there any reason to think that the population is growing to the point where resources are no longer able to sustain it?

Dr. Wilkenfeld stated that in the past, there have been "gloom and doom" forecasts, but more recent studies have found that carrying capacity of the planet is greater than those previous forecasts had predicted. A situation may also arise where evolving technology helps to provide solutions for problems with resource availability.

Is DoD polity qualified to address the mega-problems of today?

Dr. Cioffi-Revilla responded that in the closing and post-war days of World War II there was a major fundamental redesigning of major U.S. polities toward Europe and Asia. During that time, the United States learned two things: how to redesign democratic institutions on a multi-country concurrent basis and how to scientifically manage the propaganda war. The DoD was involved in the operations including the construction of NATO. The architects of

that epoch were brilliant leaders who also understood the value of applied social science. Some of these ideas are very relevant today. In confronting the mega-problems of today, it is important to understand how national level institutions need to be redesigned to address these mega-problems. Today, the theory of collective action is far more developed than it was 50 years ago. There are fundamental principles that can support highly effective collective action policies, which will be a critical advantage.

How can we create metrics to make decisions in this current era given the fact that change is happening so rapidly?

Dr. Reed responded that this brings up the question of how we can forecast political events. Can we use the same tools that have been used in different time periods? It is not clear whether forecasting needs to be different now than it was in the past because of the rapidly changing data and society of the current era.

Mr. Riley concluded that we must continue to invest in understanding megacities. We need to think about what megacities should look like and the dynamics within the city. And, given these megacity dynamics, we must determine what types of tools we will need for the future.

Panel Four: The Role of Social Sciences in National Security and Validation and Validity Concepts (Moderator: Ms. Laurie Fenstermacher, AFRL)

Social sciences (e.g., economics, political science, sociology, anthropology, etc.) inform our understanding of human behavior at various levels--individual, group, and societal. Social scientists attempt to describe and explain the influences and interactions among complex sets of factors that span human behaviors. This panel addressed the importance of social science for DoD and whole of government operations in the 21st century, providing several examples of where social science(s) have made a difference in operational effectiveness/performance. It also talked about the qualitative/quantitative nature of social science information and methods and the need for rigorous scientific methods for the development and assessment of the reliability and validity of methods and tools. Finally, the panel touched on manpower and ideas for operationalization of social science in the DoD.

Panel Members:

- Dr. Dana Eyre: How an Understanding/Utilization of Social Science is Critical for DoD Operations in the 21st Century
- Dr. Anne McGee (NPS): How Social Science is Making a Difference in DoD Operations
- Mr. Gary Ackerman: A Primer on Quantitative and Qualitative Social Science for Operators
- Dr. Chuck Ehlschlaeger: Can You Trust It? Need for Scientific Methods and Validation

- Dr. Alex Barelka: A New Workforce for a New World…Operationalization of Social Science in DoD

This panel was moderated by Ms. Laurie Fenstermacher. *Ms. Fenstermacher is the Influence and Socio-Cultural Modeling lead in the Human Centered ISR Division of the Human Effectiveness Directorate of the Air Force Research Laboratory. She was the Program Manager for the Cascading Air Power Effects Program (seeking to identify indirect effects and unintended consequences) and the government team lead for the DARPA Integrated Conflict and Early Warning System program (forecasting nation instability and development of mitigation strategies) and currently the Program Manager for Discourse Analysis programs.*

Ms. Fenstermacher stated that this panel looked at the social sciences as part of the solution to complex problems facing the USG. The panel discussed how to appropriately employ and leverage knowledge generated by the social sciences.

Dr. Dana Eyre, SOSA

Dr. Eyre is a sociologist specializing in the analysis, planning, coordination, and evaluation of social change and strategic communications activities. He holds a PhD in sociology from Stanford University. A former infantry and civil affairs officer, he has been a faculty member at the U.S. Naval Postgraduate School, George Mason University, the U.S. Military Academy, and the Pearson Peacekeeping Centre in Canada. After working for the United Nations (in Kosovo) and the U.S. Agency for International Development (in Iraq and Washington, DC), he held a Jennings-Randolph Senior Fellowship at the United States Institute of Peace. His project experience ranges from the Balkans to Afghanistan to Papua New Guinea and he has supported peace building and counter-radicalization projects for Somalia, Pakistan, and the wider Middle East. At SOSA, he leads efforts to apply advanced analytical techniques to understanding and effective action in human domain problems.

Dr. Eyre explained how the understanding and utilization of social sciences is critical for DoD operations in the 21st century. Clausewitz wrote that war is nothing but a duel on an extensive scale. War is the act of violence to compel an opponent and to propel one's will. We treat it as a fundamental truth of nature or conflict, but it is a social science theory describing the dynamics of the nation-state as it existed during Clausewitz's time. Today, states are not as concerned about the physical dominance of the world and Clausewitz's theories are less relevant.

The problem today is determining the global order. How is the world going to function going forward when the actions of small groups (non-state actors) can disrupt it? War is not a duel anymore. You cannot kill your way out of this kind of conflict. Militaries do not know how to fight this kind of war.

Social science is one of the tools that will help the DoD transform to meet the changes of the new world order. The military needs to become a post-modern phenomological specialist.

However, there are things about social science that must be understood before it can be used.

1. You cannot *use* social science; you have to *do* it. There is no social science widget. You have to think your way through the problem.
2. Social science does not provide consensus. Social scientists will not agree on the nature of the problem. The social sciences are inherently multi-paradigmatic. There is never one right answer.
3. Social science is phenomological. It is rooted in beliefs, values, and narratives. All human behavior is processed through the mind. There are many, co-existing social worlds out there.
4. Social science is not positivist. There is no single source of data or even multiple sources of data available to answer complex questions. Furthermore, the social system is always changing, meaning that we run the risk of steering by our wake. Not understanding the nature of social science can turn on you.

Therefore, the DoD has to become social scientists. Unfortunately for engineers, this is a land of essay, not the land of the problem set.

Dr. Anne McGee, NPS

Anne McGee currently serves as a Strategy Analyst for the Defense Institutional Reform Initiative. Her career as a military strategist spans over thirty years, including service at many different levels within the Department of Defense. Dr. McGee's education includes master's degrees in Business Administration, in Airpower Art and Science (from the School for Advanced Airpower Studies), and in Resourcing National Strategy (from ICAF). She is an MIT Seminar XXI Fellow, a graduate of the Joint Forces Staff College, and of the U.S. Air Force Command and Staff College. Her interdisciplinary Doctorate from Georgetown University focused on measuring the effectiveness of military educational exchange programs using public diplomacy analytic approaches.

Social science is making a difference in DoD operations. Using social science in military operations is not a new idea. Sun Tzu wrote, "Therefore I say: Know the enemy and know yourself; in a hundred battles you will never be in peril." Social science uses theory to understand intentions and to explain causal links between actions and outcomes. We need an entire spectrum of social science disciplines (economics, sociology, communications, history, etc.) to understand complex problems. While knowing the enemy's capabilities and intentions is easier to do with technological means, social science can be used across numerous applications:[3]

- Shaping (Phase 0)

[3] Operational Relevance of Behavioral & Social Science to DoD Missions. (2013). Strategic Multilayer Assessment Program, Office of the Secretary of Defense. http://nsiteam.com/pubs/U_Social%20Science%20White%20Paper%20Approved%20for%20Public%20Release%2014Mar13%20Final.pdf

- Stability Operations
- Deterrence/Compellence Operations
- Nuclear Warfare
- Counterterrorism and –radicalization
- Information Warfare
- Planning and Assessment
- Intelligence
- Organizational/Workflow
- Decision-making
- Knowledge Management in Cyber Realm/C2
- Social Sensors
- New Analytic Techniques

For example, social science is particularly well suited for planning and assessment activities. Traditional operational planning includes PMESII, DIME, DOTMLPF, and MISO/MIST. Phase zero activities also benefit from social science insights at the strategic and tactical levels as U.S. forces compete for influence over populations. Understanding populations is particularly important for getting "left of boom" in counterterrorism and counter-radicalization efforts.

Social science can also be used in nuclear deterrence. It provides insights into what is of value to the other side and ways in which we can hold those things at risk. Additionally, we not only need to concern selves with what the other side thinks/might do, but also what they believe about United States and how our behavior and statements are interpreted. For deterrence to be effective, we must be credible in the minds of the opponent (which includes emergent states, non-state actors, and opponents with different success calculus).

All instruments of power, especially soft tools, must be employed in the realms of influence, deterrence, analysis, and planning.

Mr. Gary Ackerman, START

Mr. Gary Ackerman is the Director of the Special Projects Division at the National Consortium for the Study of Terrorism and Responses to Terrorism (START). Prior to taking up his current position, he was Research Director at START and before that the Director of the Weapons of Mass Destruction Terrorism Research Program at the Center for Nonproliferation Studies in Monterey, California. His research encompasses various areas relating to terrorism and counterterrorism, including terrorist threat assessment, terrorist technologies and motivations for using chemical, biological, radiological, and nuclear (CBRN) weapons, radicalization processes and the modeling and simulation of terrorist behavior. Mr. Ackerman possesses an eclectic academic background, including past studies in the fields of mathematics, history, law, and international relations. Ackerman was a member of the WMD Expert Advisory Group of the Information Sharing Environment initiative, Office of the Director for National Intelligence (2007-2008) and has testified on terrorist motivations for using nuclear

weapons before the Senate Committee on Homeland Security in April 2008. He has also headed more than ten large government-sponsored research projects in the past five years.

Mr. Ackerman presented a primer on quantitative and qualitative social science for operators. He began by reviewing the scientific method (Figure 4): hypothesis generation, measurement, testing, and confirmation/modification of hypothesis. However, with social phenomena, the scientific method becomes a lot more complicated. Social science is often referred to as a "soft" science, but in this case soft means harder (Figure 5).

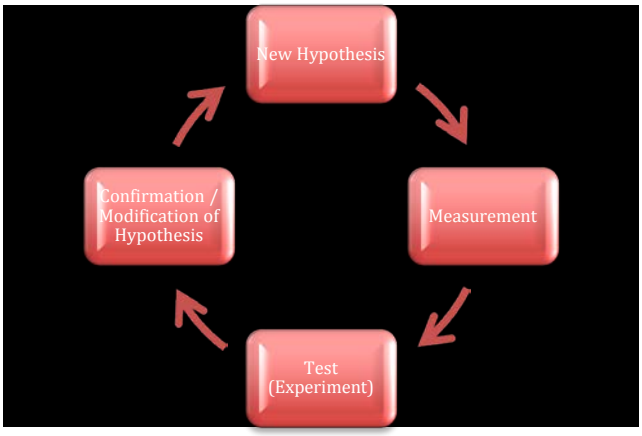

Figure 4. Scientific Method

Natural Science	Social Science
Reproducible experiments	**Often cannot directly manipulate variables of interest**
Random assignment of "treatment" and "control" groups	**Comparable "controls" are hard to identify; random assignment is difficult if not impossible**
Can independently manipulate variable of interest	**Can rarely manipulate variables independently**
Measurement is usually direct; straightforward	**Measurement is often indirect; controversial**

Figure 5. Natural Science vs. Social Science

As in the natural sciences, controlled experiments are used in social science (e.g., in psychology), but the preponderance of variables and interactions between them are often more complex than in the natural sciences. More often, controlled experiments are not possible. Instead, social scientists must use natural experiments, pattern detection, process tracing, and close observation. Social science embodies a range of rigorous methods expressly designed to measure and explain human behavior.

The basic building blocks of social science analysis are dependent and independent variables. Dependent variables are the changeable things we want to explain. Independent variables are the changeable things that might affect how dependent variables change.

There are two ways to conduct analysis in social science: inductively or deductively (Figure 6).

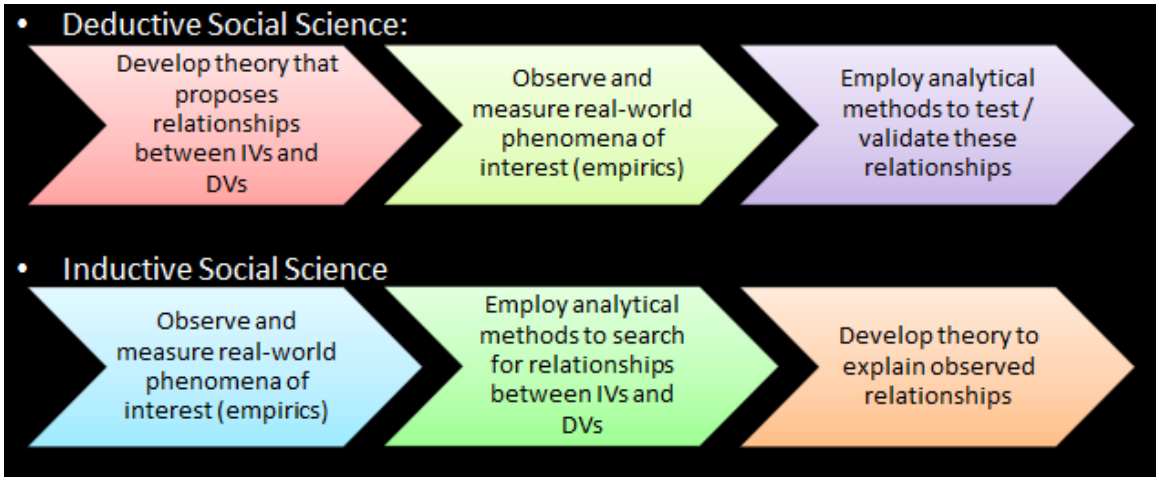

Figure 6. Basic Building Blocks of Social Science

The qualitative toolkit contains a number of different methodologies including case studies (which differ from historical narratives), ethnography, qualitative comparative analysis, and surveys among others. The quantitative toolkit includes regression analysis, agent-based models, and social network analysis.

When using social science, it is important to understand that correlation is not the same as causation—this is one of the biggest mistakes users of social science make. This is useful not only for operators to keep in mind regarding their own observations, but especially when taking in data from local nationals, during shift-briefs, during the right-seat/left-seat rides at the start of a deployment, or from the unit intelligence officer, etc.

The most important takeaway from this presentation should be that answering "why" questions requires variation in the dependent variable. If this element is missing, it leads to spurious results. The danger of this fallacy is represented by the following example: "Because almost every jihadist has a beard, having a beard is a predictor of jihadism." This claim is obviously false. If this were a real hypothesis, one would first need to establish that most *non-jihadists* do not have beards, which is FALSE.

Dr. Chuck Ehlschlaeger, USACE ERDC

Dr. Ehlschlaeger received his Ph.D. from the University of California at Santa Barbara in 1998. After 14 years in academia performing theoretical and applied research in technical geography, he returned to the Army Corp of Engineers Research and Development Center (ERDC) in Champaign, IL to do applied human geography research in demographic modeling, visualization, and social cultural simulation models. Dr. Ehlschlaeger is currently the technical lead on SMA/ERDC's Megacities-RSI project exploring ways to improve strategic operational

planning with higher quality social science data. He infrequently teaches a class at the University of Illinois in Urbana.

Dr. Ehlschlaeger discussed the difficulty in validating social science methods. He began by presenting best practices in scientific method for the academic social sciences.

1. Observe phenomena you want understood
2. Propose hypothesis to explain phenomena, comparing it to all other hypotheses created to explain phenomena
3. Determine experiment to test reject one or more collected hypotheses
4. Do experiment, **publish results**
5. If hypothesis is rejected, then reduce set of hypotheses by the rejected hypotheses
6. If researcher believes there only one hypothesis is left, make it a theory, **publish "theory article"**

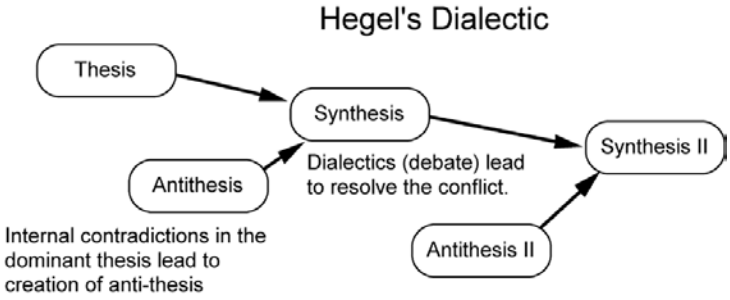

Figure 7 (Social) Science Getting Messy

However, applied social science gets more complicated and messy very quickly. From the military viewpoint, a set of validated social science theories are a good foundation for building a framework capable of informing decision-making. However, these social science theories are NOT validated for specific military decision-making processes. Academic validation is the repeated hypothesis testing in order to disprove or set the limits on articulated theories. The academic validation process is determined by each scientific discipline and changes as the discipline adopts new methods and techniques to discover and refine their foundation of knowledge.

Non-academics often see peer-review articles and books as "THE pieces of the knowledge foundation." Academics recognize that the publication of an individual article is not validation but only the first step of articulating an anti-thesis to an existing thesis (Figure 7). When compared to the "hard" sciences, natural and social sciences are willing to entertain more simultaneous antitheses. It is only after enough peer-review articles are published that thesis and anti-thesis can be discarded in favor of the synthesis. (The synthesis then becomes the "old thesis" that needs to be improved.) Thus, it is *dangerous* for a non-scientist to treat a discipline's theories as fact without first consulting with scientists familiar with the limits of those theories.

Traditional DoD methods have relied on empiricism to understand the world, relying on scientists for "theory" when experience of repeated empiricist techniques cannot provide a

complete First Order Predicate Calculus representation (sometimes referred to as chains of logic) for understanding the situation. In a perfect world, there will be validated theories for the DoD to rely on, but in order to get precise, actionable knowledge, we need collect and maintain accurate data in the places we operate in for validating experiments on the conflicting theories or we will be regularly coming to wrong conclusions.

Dr. Alex Barelka, Human Performance Solutions

Dr. Alex J. Barelka, PhD, PMP, is a Management/Information Technology professor and consulting professional specializing in leadership, trust/suspicion, information technology, and organizational change. He has participated in several large-scale Organizational Development efforts and has over 20 years of practical program management and analysis experience in the defense industry and related fields.

Dr. Barelka presented a brief called, "A New Workforce for a New World…Operationalization of Social Science in DoD." Dr. Barelka focused on how to implement the best practices and avoid pitfalls mentioned by the panel. LTG Flynn stated that the DoD has to do a better job at understanding the social domain. It needs to grow the capability to do social science effectively.

It is interesting that the defense and social science communities have very strong and very different cultures. Scientists deal with theories and methods while operators have to make decisions regarding the use of lethal force with less than perfect information. There is a mismatch between the two cultures. Nevertheless, the DoD has to build a bridge in the form of developing military social scientists.

Previously, we thought we could take social scientists from academia and send them to Iraq or Afghanistan to fill the DoD social science needs. While it was a step it the right direction, it did not bridge the gap between the two communities. We need social scientists raised in a DoD environment that can deploy to satisfy mission requirements. The social scientists can and should be drawn from both uniformed and civilian personnel.

Building a cadre of military social scientists cannot be achieved through training; it must be done through education. It requires years-long investment in the education of the social science workforce to develop the critical thinking skills necessary to do social science. It cannot be achieved through weeks-long training and PowerPoint slides.

The military needs people trained in psychometrics. Afghanistan at one time was the most surveyed population on the planet with surveys containing upwards of 100 questions, yet when it came down to it, the surveys asked 8 questions. We need people who can understand military requirements and implement social science methods efficiently. The DoD also needs to understand how to work with qualitative data batter. Afghanistan also generated troves of qualitative databases, but we need people who understand qualitative methods to make sense of the collections. Finally, the DoD also needs more social network analysis scientists to catch up with the demand generated by commanders.

Discussion

Many panelists talked about validity, but no one mentioned peer review, which is a crucial step in the natural sciences.

Social science journals use peer review in the same way natural science journals do. There are also conferences. Time limits are a big problem, however. The pace of change in the social sciences is so rapid that quick review is essential. SMA is one example of an organization doing social science, including peer review, in under one year.

At the end of the day, it is the soldier who has to deal with these complex social problems. How do we get social science to them?

The troops are the most critical element of social science in the DoD because they are living with complex social problems daily. Platoon leaders and squad leaders are having to become social scientists—and no one has told them how. We have to engage them; military social science has to be employed from the bottom up.

Feedback from Commands: What Are The Pressing Needs of the Commands? (Moderator: COL Chuck Eassa, Joint Staff, J38)

Representatives from the Commands discussed their pressing needs and key operational requirements.

Panel Members:

- USNORTHCOM: Mr. Randy Pearson
- U.S. AFRICOM: Mr. Mike Casciaro
- CENTCOM: Mr. Marty Drake
- USPACOM: LtCol Mike Jernigan
- SOCOM: COL Brad Dostal
- SOUTHCOM: Mr. Juan Hurtado

COL Chuck Eassa, JS J38, moderated. *Colonel "Chuck" Eassa has served in a wide variety of positions throughout his 27-year career. His assignments included duty with: the 4th Battalion, 4th Field Artillery, 75th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma; 8d Infantry Division Artillery; 6th Battalion, 29th Field Artillery, 1st Armored Division Artillery, Idar-Oberstein, Germany; Readiness Group Atlanta Field Artillery Team, 1st Army; 3rd Army, Fort MacPherson, Georgia, and Camp Doha, Kuwait; Assistant G3 and Exercise Control, Battle Command Training Program, Fort Leavenworth, Kansas; Planner and Information Operations Officer, V (U.S.) Corps, Heidelberg, Germany, Camp Victory, Kuwait, and Baghdad, Iraq; Deputy Director, U.S. Army Information Operations Proponent, Fort Leavenworth, Kansas; J39 Information Operations Officer, U.S. European Command, Stuttgart, Germany; Information Operations Officer, NATO's International Joint Command, Kabul,*

Afghanistan, U.S. Forces-Afghanistan. He currently serves as the Joint Staff J-38 Chief of the Information Operations Directorate. Colonel Eassa was transferred from Field Artillery to the U.S. Army's Functional Area 30 (Information Operations) in 1998. His military education includes the Field Artillery Basic Course, Fort Sill, Oklahoma; Infantry Officer Advanced Course, United States Army Infantry School, Fort Benning, Georgia; United States Army Command and General Staff College and the School of Advanced Military Studies, Fort Leavenworth, Kansas; and United States Army War College, Carlisle Barracks, Pennsylvania.

COL Eassa stated that this panel comprised a series of experts representing the COCOMs. The panelists have a variety of backgrounds including science, technology, and engineering and represent both civilian and uniformed services. Diversity is one of the COCOMs' greatest strengths and weaknesses. Operators frequently move to where they are needed while most civilians typically stay in one area where they develop skills, expertise, and understanding of long-term needs and requirements. Developing COCOM requirements can take 3-5 years, which is a major challenge to military officers who cycle through the commands. Another challenge faced by the COCOMs is operationalizing strategic-level guidance. The COCOM representatives on the panel provided presentation regarding the pressing needs of their commands.

Mr. Randy Pearson, USNORTHCOM

Mr. Randy Pearson is a national security professional with over fifteen years of military, foreign affairs, policy, strategy, and intelligence experience. He represented national-level departments in multi-lateral and interagency forums on subjects that include nuclear safety policy, defense policy and strategy, foreign relations, counter threat finance, counternarcotics, and special operations. He served as a senior intelligence analyst authoring a range of intelligence products covering subjects that include foreign militaries, human intelligence policy, and global terrorist organizations. He currently advises U.S. Northern Command's counter threat finance program and is a lecturer for graduate studies in national security, interagency relations, and critical infrastructure at the University of Colorado at Colorado Springs, and the University of Denver.

Mr. Pearson stated that threat networks are incomprehensively complex. He said that in an era of declining budgets, the expertise that the U.S. built over the course of a decade of war will be difficult to sustain, much less support the improvement of our understanding of threat networks and how to counter them. He also said that counter-transnational threat organization (C-TCO) activities are now seen by some as a further drain on limited DoD resources, which exhibits rice bowl defense—something that runs counter to what is now needed among interagency partners. COCOMs need to figure out how to weather this budget storm while maintaining the hard learned and earned talents from a generation tempered by war.

Understanding threat networks and how they exploit infrastructures and other systems is critical to their detection, deterrence, and eventual dismantlement. These threat networks

are transdimensional in that they operate across boundaries, borders, domains, and infrastructures. Effectively countering such threat networks requires that interagency partners collaborate to form their own networks, leveraging interagency authorities and capabilities. As General Stanley McChrystal says, "it takes a network to fight a network." COCOMs need to work together with interagency partners now more than ever.

To address the enormous requirement for cooperation among blue forces, USNORTHCOM emphasizes liaisons with other agencies, which is extremely helpful in understanding how we can support each other. This liaison activity facilitates trust building and cooperative partnerships (e.g., law enforcement, State, Treasury), developing an understanding of capabilities and authorities, which in turn allows for them to be applied or leveraged as desired. The counter threat finance mission does this by providing DoD support to law enforcement and other interagency partners. This support effectively leverages law enforcement authorities assisting the CDRUSNORTHCOM in the shaping of his operational environment. Business cards are exchanged and working relationships are effectively established long before there is a battlefield or a crime scene.

LtCol Mike Jernigan, USPACOM

Lieutenant Colonel Mike Jernigan was commissioned in 1992 and holds degrees from Auburn University, the Naval Postgraduate School, and Pakistan's National Defense University. He is a Combat Engineer and his first assignment was to 8th Engineer Support Battalion, Camp Lejeune, NC where he served as a Platoon Commander and Company Executive Officer and deployed in support of Joint Task Force 6's counter-narcotics operations. In 2001, he was assigned to 1st Combat Engineer Battalion, Camp Pendleton, CA where he served as a Company Commander, the Operations Officer, and the Executive Officer. During Operation Iraqi Freedom 1, Lieutenant Colonel Jernigan commanded 1st Combat Engineer Battalion. In 2003, 1st Combat Engineer Battalion won the Marine Corps Combat Engineer Battalion of the Year. In 2004, he was selected as a USMC National Fellow and worked for the Chief Executive Officer of The Home Depot in Atlanta, GA. He next was assigned to Marine Forces Pacific, Camp Smith, HI where he served as Engineer Officer and Operations Planner. In January 2007, Lieutenant Colonel Jernigan deployed with Marine Forces Central as an Operations Planner and Force Protection Officer in support of Operations Iraqi and Enduring Freedom. He then was the Commanding Officer of Combat Logistics Battalion 3 where he deployed to Afghanistan in support of Operation Enduring Freedom. Combat Logistics Battalion 3 won the 2009 Marine Corps Logistics Unit of the Year. He then attended the Pakistan National Defense University. He is assigned to U.S. Pacific Command where he has worked in the South Asia Branch, the India Strategic Focus Group, and is currently assigned to the Strategy Branch.

LtCol Jernigan stated that one of PACOM's prime challenges is the expanse and diversity of its AOR, which includes 36 countries, hundreds of languages, five of seven treaty allied partners, five of the largest economies, five of the smallest countries, as well as the largest nation on earth. The division of Pakistan and India into two AORs is also a challenge. These countries are nuclear armed and do not like one another. Furthermore, PACOM is the only

COCOM that borders all of the other COCOMs. EUCOM does not have to worry about Chile, but PACOM cannot afford that view.

In much of Southeast Asia, counterterrorism is a major concern. PACOM's objective is to stay in steady state operations while strengthening relationships. PACOM prefers the terminology steady state to phase zero because phase zero implies escalation.

North Korea remains a concern for PACOM. Kim Jong Un is a young leader who is wrestling for personal control of power. With Jong Un's relative inexperience, North Korea's history of brinkmanship becomes particularly dangerous. North Korea has missiles that can reach the United States as well as our allies.

China is the only rising near peer to the United States in the PACOM AOR. The Chinese have uncertain military objectives. It is not clear what they are planning to use their large, modernizing military for. Additionally, the Chinese have made excessive territorial claims in violation of international norms and laws.

Furthermore, the small islands of Oceania host high rates of transnational crime and human trafficking. What is troubling in that region is that people who do bad things (criminals, terrorists, etc.) tend to group together and augment one another.

PACOM significantly invests in building relationships with many of the smaller countries in the AOR because the time when the United States could dictate to small countries has passed.

Approximately 60 percent of natural disasters occur in the Pacific. These events tend to be fast moving. In the Pacific, PACOM has 36 hours to respond to crises and is very involved in disaster relief.

Finally, like plastics in the 1950s, we know cyber is going to be big in the future, but we are not sure how big. PACOM is a maritime theater. Most of the region's economy goes by ship, but space/cyber is becoming the next commercial highway. The USG must protect commercial highways.

Mr. Mike Casciaro, U.S. AFRICOM

Mr. Mike Casciaro has been with U.S. Africa Command since its inception, starting as a Theater Security Cooperation Planner for the Initial Planning Team (IPT) for AFRICOM, then working as the principal TSC authority, SPP (J5) planner, and Africa expert for the Transition Team (TT). As SCP Division Chief he provides oversight, policy guidance, funding recommendations and program implementation over the bulk of all security cooperation funding that the Command controls, executes, prioritizes or influences. He serves as the primary conduit between the Command, the Office of the Secretary of Defense, and the Department of State for security cooperation program funding and prioritization.

Mr. Casciaro presented AFRICOM's requirements. Some may ask why Africa is important to the United States. The answer is that great instability allows great access for unruly characters as can be seen by the rise of terrorist groups in northern Africa. Additionally, the ability of non-state actors to move into ungoverned terrain is extremely dangerous to U.S. national security. Furthermore, Africa has many resources. While the United States has shifted towards the Pacific, China has shifted towards Africa. They make deals with dictators to extract natural resources using Chinese workers. This is a huge problem. It represents unfair competition and is not good for Africa.

Illicit trafficking is also a huge problem in Africa. Drug money has already corrupted many governments and could cause further instability.

The sheer size of Africa (i.e., the tyranny of distance) is huge. That makes operations all the more difficult. Additionally, the range of efforts AFRICOM is called on to undertake is enormous, especially given the resources provided. AFRICOM engages in several lines of efforts including counterterrorism, humanitarian assistance, training, border security, maritime security, counter trafficking, and defense institution building.

Africa is a region where the DoD must employ soft levers of power. Putting troops on the ground in Africa is not going to happen. Therefore, AFRICOM has to enable African countries to work towards our objectives. Yet there are many problems involved in this undertaking: some governments have no institutions to work with, some militaries lack basic training, some governments lack the ability to pay troops, etc. These undermine the ability of some nations to be good partners.

Therefore, AFRICOM requires everything. It has few resources when it comes to building capacity, staff, and troops. AFRICOM needs ISR, personnel, and more maritime forces. Meanwhile, AFRICOM is doing the best it can with what it has.

Mr. Marty Drake, CENTCOM

Mr. Marty Drake is the Chief of Science and Technology Division and Command Science Advisor to U.S. Central Command located in Tampa, Florida. Directs a staff chartered to conduct discovery, research, analysis, and sponsor development of new and emerging technologies and techniques which have the potential to provide solutions to Headquarters and Component validated Joint needs. Additionally, pursues integrating and non-material solutions to satisfy current and future military operational capability gaps. Holds a Level III Systems Planning, Research, Development, and Engineering (SPRDE) qualification for Technology Management. Frequently lectures on technology impacts to the current and future military force.

Mr. Drake applauded the use of operationalized social science. He asked whether if an SMA-like analysis had been conducted prior to the U.S. invasion of Iraq whether the USG would have chosen to dismantle the Ba'ath party. It had consequences we did not understand at the time. In Afghanistan, there were cultural biases and misunderstandings that challenged operational success. SMA had an improvised explosive device (IED) study that layered information and analyzed IED placement patterns, presented in a visual display. It showed

the mostly likely places for attacks. There was one place on the map that showed up as high threat but where we had seen no attacks. Sure enough, seven days later, U.S. forces were attacks on that spot. There is something to operationalized social science. CENTCOM has directly benefitted from the SMA process. When you layer information, you become a little smarter, more informed, and can anticipate unintended consequences.

CENTCOM is facing new threats (threat financing, supporting rule of law, etc.) that traditional military forces have not had to face. The military is the U.S. institution with the capacity to address these threats, so it has to learn to expand its capabilities.

When the military moved from service-centric to jointness, there was initial pushback. However, we soon realized that there was something to this approach. Now we are on the verge of fundamentally changing how the military looks at things. Multilayered information is coming in from all sources. The information highway has sped us up, presenting us with new challenges and new opportunities. Furthermore, CENTCOM has increased its interagency liaisons and has built stronger relationships with partner countries. CENTCOM would not consider engaging in major conflict again without applying the basic tenants of the SMA process.

COL Brad Dostal, SOCOM

COL Dostal served as an Army Congressional Fellow for Representative Jim Saxton, a senior Member of the House Armed Services Committee and also served with the Office of the Chief Legislative Liaison, in Washington, D.C. COL Dostal later commanded both the Des Moines and Minneapolis U.S. Army Recruiting Battalions. Following command, COL Dostal deployed to Afghanistan as Chief of Staff for Combined Joint Task Force Paladin, the theater Counter-Improvised Explosive Device Task Force. COL Dostal completed a tour of duty with the Office of Assistant Secretary of Defense for Legislative Affairs in Washington, D.C., with oversight over the Special Operations and Low Intensity Conflict portfolio. COL Dostal graduated from the Dwight D. Eisenhower School for National Security and Resource Strategy at National Defense University and is currently assigned to the Strategy Division at USSOCOM.

COL Dostal stated that given the reality of today's resource constrained budget environment coupled with the challenges of an unpredictable world, SOCOM will meet future challenges through a globally networked force of SOF, interagency, allies, and partners working together to address regional contingencies and threats to stability. The SOCOM global engagement strategy pursues innovative, low-cost, small footprint approaches to build relationships with partners in support of U.S. interests. SOCOM will rely on an enduring and persistent approach abroad to build and sustain relations. The benefits of persistent relationships were demonstrated following 9/11, as the USG had partners to facilitate basing in Central Asia since these partners were developed through Joint Combined Exchange Training (JCET) events executed by SOCOM forces in the late 1990s.

SOCOM is a globally based, functional command well suited to provide unique capabilities required in an unstable world with volatile trends including the increasing influence of

Transnational Organized Crime, Violent Extremist Organizations, and other non-state actors threatening global stability. SOCOM will mitigate these challenges by strengthening a global network of influence with a forward deployed presence of highly trained personnel increasing the capacity of allies, partners, and the interagency community to respond to regional problems. To achieve objectives in a resource constrained environment, SOCOM will pursue innovative, low cost, small footprint operations and rely to a greater degree on partnerships. One of the lessons of Iraq and Afghanistan is that you cannot surge trust—it is the product of enduring relationships. By building stronger and more persistent relationships, SOCOM will build trust and increase the capacity of the Theater Special Operations Commands (TSOCs) to support the Geographic Combatant Commanders (COCOMs) and Chief of Missions.

To be successful in a decentralized global approach, SOCOM recognizes the importance of the SOF operator as the critical and irreplaceable part of the effort to sustain global forward presence and build strong relationships. SOF operators are at the core of everything SOCOM does, and define the first "SOF Truth" that humans are more important than hardware. Since SOCOM's continued success depends on the capacity of its personnel, pursuit of initiatives to enhance the performance of operators is a critical requirement. SOCOM will sustain the language proficiency and regional expertise of its operators while expanding the ability to function in non-Western cultures. SOCOM will also pursue tools to enhance human performance while strengthening the physical, mental, and emotional health of its force. By focusing on training and technology to enhance human capabilities, SOCOM will increase the speed and depth of understanding of deployed forces enhancing their ability to engage with partners and advance U.S. interests abroad.

Mr. Juan Hurtado, SOUTHCOM

Mr. Hurtado is the Science and Technology Advisor, Headquarters United States Southern Command, Miami, Florida. He serves as the principal advisor in scientific matters and supports the Command through the formulation of materiel solutions to operational needs, demonstrations of technology in operational scenarios, coordination for rapid system development, integration of mature technical capability into field activities, and joint experimentation involving systems and concepts.

Mr. Hurtado spoke about SOUTHCOM's requirements and the great support provided by Dr. Cabayan, Mr. Wyatt, Mr. Riley and Mr. Fogg from OSD. One of SOUTHCOM's primary missions is to provide detection and monitoring support to U.S. law enforcement agencies about any mode of transportation able to carry cargo of interest. SOUTHCOM is also interested in foliage penetration capabilities to help operations under the jungle canopy. The dense and vast jungles provide a sanctuary to illegal armed groups in the theater. There is also interest in ISR capabilities since SOUTHCOM's AOR covers a large land mass as well as air and water. Cyber security is another area of concern, especially during upcoming international events. SOUTHCOM has always operated with resource constraints and, as a consequence, it has developed strong interagency partnerships to efficiently carry out its mission. Approximately 22 U.S. agencies have assigned a representative to SOUTHCOM,

which results in strong information sharing and collaboration for a government approach in the AOR. SOUTHCOM's mission sets include counter transnational organized crime, which includes counternarcotics trafficking and disaster response. Additionally, IEDs is an area of concern in countries such as Colombia, which has the second highest rate of IED events in the world. There were approximately 1700 incidents in 2013. JIEDDO has been of great help in providing support to SOUTHCOM and the Colombian Army in this area.

Discussion

COL Eassa offered some concluding remarks. The panelists have offered an extraordinary view of the breadth and depth of the COMCOMs' requirements. However, there are some constants. First, there is a requirement for rapidly integrating and sharing knowledge. Strategic and operational planners have to marry capabilities with operational plans. Second, how are the megatrends identified in panel two likely to impact the operational environment? Third, how do we effectively build relationships with partners? The challenge for the SMA effort is to look at these problems from a hard and soft perspective to enhance U.S. capabilities and provide solutions for military planners.

Mr. Casciaro mentioned the Chinese pivot to Africa and China's ability to secure access to natural resources. How is AFRICOM engaged in providing access for American companies in Africa? How do we counteract China's efforts?

Mr. Casciaro responded that AFRICOM cannot match the funding that China provides to its businesses to extract resource sin Africa. Unlike China, when the USG does construction projects in Africa, we hire Africans so that the benefit is not simply the end result of the construction. What you will not see is a mini-America pop up where ever the United States has supported construction efforts.

How much success are the services having in implementing an SMA-like capability? How is that being incorporated in plans going forward? Are the services willing to invest in this kind of capability?

Mr. Hurtado responded that J2 conducts socio-cultural work. Furthermore, SMA is prolific in its publications, which SOUTHCOM reads with interest. There is a lot of cooperation within SOUTHCOM's community of interest (COI) and cooperation on many of these topics.

Mr. Casciaro stated that AFRICOM is a big supporter of SMA-like activities. Ninety-nine percent of what AFRICOM does is soft. J2 has a cultural anthropologist who looks at the mosaic of issues AFRICOM faces. The problem is that AFRICOM has limited time and resources. We have so many different crises that we are constantly juggling. We would love to use more of these products, but do not have the resources to conduct the studies in house.

Mr. Wyatt stated that many of the panelists spoke about the threat posed by TCOs and building partner capability. Yet these requirements have not come to his attention. He asked each of the

COCOMs to get in touch with him regarding the 2-3 things the COCOMs really need and that he has to pay attention to. He did not want to see least common denominator requests.

There is obviously a need for nuanced intelligence and building capability to react to the next unanticipated crisis. How are we marrying these two?

COL Dostal responded that SOCOM leverages a variety of authorities allowing it to build partner nation capacity and advance U.S. interests. The section 1206 Building Partner Capacity authority is one of the largest and most frequently used, allowing SOCOM to train and equip partners to build counterterrorism capacity. There is a variety of other authorities available as well (e.g., Sect 1207 Global Security Contingency Fund & Counternarcotics authorities). To improve execution of the current authorities and better support partner nations interests as well as U.S. interests, SOCOM is creating a more robust corps of foreign liaison officers (LNOs) who will work within the SOCOM HQ at MacDill AFB. By directly embedding partner nation officers within the SOCOM staff, we will be able to more rapidly share information and effectively address shared regional concerns.

AFRICOM noted that authorities present a problem in that they are narrowly defined and often do not cross the entire problem set faced by AFRICOM. What we have done is developed a series of plans starting with the theater campaign plan and moved to country-level plans. We identified intelligence objectives. If we built a fusion cell in Nigeria, we would have to draw on different authorities to fund different activities.

Mr. Hurtado stated that SOUTHCOM has long known that it cannot achieve its objectives by itself. It has robust interagency relations to draw on contributions of other agencies.

Aside from the indirect approach mentioned by AFRICOM, is there another way to engage with partner countries? How do we leverage allies to have a positive impact on a region?

Mr. Casciaro stated that AFRICOM is broken down into five regions and each region has its own organization. Northern Africa has the weakest organization. We have been working with Algeria to get them to do more with their neighbors. AFRICOM tries to encourage the stronger countries in the region to take on a leadership role. We also look to our European partners for support. The French and British have a large interest in Africa. We leverage what they are doing so that we do not replicate the effort. We focus on deconfliction, coordination, and synchronization with our partner countries.

What are your thoughts on qualitative and quantitative measures for how well outputs are feeding into outcomes.

Mr. Casciaro stated that funds spent on peacekeeping return great dividends to the United States. Up until now, measures of success relied on the number of peacekeepers trained. But now we are looking at outcomes. How well did they do? We had Nigerian troops in Sudan completely fail in their mission, representing millions of wasted dollars. Assessment should not stop on deployment. It should affect where we invest out money and which partners we work with. He would rather invest in high quality troops like those from Uganda and Kenya

who care about their soldiers and will reinvest in their forces so they can generate a stronger, more capable force.

Mr. Pearson stated that the DoD counter threat finance (CTF) program has developed metrics, becoming more precise over the last few years. Current CTF metrics reporting has evolved from simple input/output data to more a descriptive accounting that ties CTF support from operational or investigative efforts directly to strategic goals. Thus, CTF effectively shows how its daily activities support national objectives and counter threat outcomes, which justifies the program's purpose and funding.

Panel Five: Transnational Criminal Organization (TCOs): A Global Perspective (Moderator: Mr. Chris Ploszaj, IDA)

The continually evolving strategic environment coupled with the ascendant role of Transnational Criminal Organizations (TCOs) necessitates a comprehensive understanding of these organizations. TCOs represent a globally networked national security threat and pose a real and present risk to the safety and security of Americans and our partners across the globe. This panel will examine the "new" face of these transnational crime organizations and will provide a geopolitical perspective and implications for U.S. national security.

Panel Members:

- Mr. Ron Chavarro, FBI
- Mr. Randy Pearson, USNORTHCOM
- Dr. Regan Damron, Booz Allen Hamilton/EUCOM

Mr. Chris Ploszaj, IDA, moderated the panel. *Christopher S. Ploszaj is a Research Associate with the Joint Advanced Warfighting Division at the Institute for Defense Analyses. He joined IDA in May 2005. His past work has focused on U.S. counterterrorism policy in Africa, joint urban operations, and the ongoing counterinsurgencies in Iraq and Afghanistan. For the last five years, he has been researching transnational criminal organizations, to include work on counter threat finance and developing an adversary perspective through personal interviews with current and former members of transnational criminal organizations.* Mr. Ploszaj noted that transnational crime affects all of the Commands.

Mr. Ron Chavarro, FBI

Mr. Chavarro is currently a Supervisory Special Agent - Unit Chief in the Criminal Investigative Division for the Federal Bureau of Investigation. In this capacity Mr. Chavarro provides management oversight for all Domestic and International Transnational Organized Crime (TCO) Investigations involving Narcotics Trafficking, Violent Crime, Money Laundering, Weapons Trafficking and other associated criminal activities with a focus on Mexican, Caribbean, and Central and South American TCOs. For the past 19 years, Mr. Chavarro's FBI investigative and managerial focus has been on Narcotics Trafficking, Violent Gangs and

Violent Crime matters as either a field investigator or supervisor, or as a Headquarters manager. Prior to being appointed to his current position, Mr. Chavarro served as the Deputy Director for the Organized Crime Drug Enforcement Task Force Fusion Center where he managed the investigative reporting and inter-agency coordination and de-confliction of U.S. federal law enforcement agencies involved in domestic and international criminal investigations. Mr. Chavarro also serves as the FBI's lead point of contact and coordinator for the Department of Defense's Transnational Organized Crime Workshop.

Mr. Chavarro presented a strategic overview of the FBI's top TCO threats and the challenges faced in addressing these threats. The FBI ranks the Sinaloa Cartel, Los Zetas Cartel, and Gulf Cartel as its top three TCO targets. There are many reasons why the FBI has labeled these organizations as its top priority, but the primary reasons are because of the violence that is associated with these groups; how influential they are with respect to gang activity and compromising the integrity of public officials in the United States and elsewhere; and how financially successful they have become from being able to move a large volume of narcotics into the United States.

The FBI views these cartels as TCOs. In as much as some TCOs are known to have loose associations with terrorist organizations, TCOs can become a national security threat. The FBI's goal is to disrupt and dismantle these organizations—simply arresting 30-60 members of these groups at a time and then sentencing them to prison is not enough.

One of the FBI's main problems with respect to TCOs is related to TCO finance. If we cannot take away proceeds from the organizations to ensure they cannot operate, then the TCO will not be defeated. The challenge is to identify these illicit networks and money laundering organizations that allow TCOs to exist and function. These TCOs are profit driven organizations. Although we have an understanding of money laundering by TCOs, we do not understand it well enough. Another challenge is that post 9/11, the FBI redirected resources towards counterterrorism efforts, which has constrained resources for the FBI's effort in combating these TCOs.

TCOs are sophisticated organizations, and trying to combat them is becoming more difficult. Oftentimes, legislation does not keep up with the sophistication and evolution of TCOs and their tactics. We must ensure that our legislation continues to evolve as the TCOs become more sophisticated.

There are many challenges in combatting TCOs and, luckily, this is not an issue that FBI handles on its own. Most of what the FBI does and will do going forward is done in a task force environment with all of its federal partners. It is primarily because of the successes of the task force and interagency environment that the FBI can be successful in combatting TCOs.

Mr. Randy Pearson, USNORTHCOM

Mr. Randy Pearson is a national security professional with over fifteen years of military, foreign affairs, policy, strategy, and intelligence experience. He represented national-level departments in multi-lateral and interagency forums on subjects that include nuclear safety policy, defense policy and strategy, foreign relations, counter threat finance, counternarcotics, and special operations. He served as a senior intelligence analyst authoring a range of intelligence products covering subjects that include foreign militaries, human intelligence policy, and global terrorist organizations. He currently advises U.S. Northern Command's counter threat finance efforts and is a lecturer for graduate studies in national security, interagency relations, and critical infrastructure.

Mr. Randy Pearson, USNORTHCOM, spoke from his experience in counternarcotics and counter threat finance (CTF). He stated that the threat is very hard to outpace. When we effectively countered air-bridges, narco-traffickers moved to fast-boats. When we found ways to counter the boats, they moved to submersibles, then FedEx, then stored value cards, and now on to virtual money and virtual banks as with Bitcoin and Linden Dollars. The threat is fluid and adaptive, able to exploit every infrastructure with a great degree of impunity, making the understanding of threat complexity an enormous task. Nobody can accomplish this task alone.

The 2011 Strategy to Combat Transnational Organized Crime assigned primary roles to the Departments of State, Justice, and Treasury, and assigned a small support role to DoD regarding information sharing in which CTF plays a significant role. CTF effectively translates warfighting to crimefighting by working with interagency partners to provide a CTF Specialist capability that law enforcement often does not have and leverages authorities that are primarily law enforcement centric. This increases interagency collaboration and information sharing that results in threat detection, case development, and eventually prosecution. It all starts with building trust at the operator level and working together to exploit each other's strengths in pursuit of our common national counter TCO goals. The CTF program has worked hard over the last eight years to build interagency partnerships and information sharing processes that are the bedrock of what DoD and its interagency partners need to do now and are critical to success in combating TCOs who are already riding megatrends into the future.

Dr. Regan Damron, BAH/USEUCOM

Dr. Regan Damron, a consultant with Booz Allen Hamilton (BAH), is currently providing methodology development and analytic support to U.S. European Command (EUCOM) Strategic Foresight on-location in Stuttgart, Germany, where he has published Unclassified papers and briefs on subjects ranging from online anonymity and additive manufacturing to weapons and drug trafficking and the "New Silk Road(s)." He holds a Ph.D. in Comparative Politics, International Relations, and Methodology from The University of Georgia. While finishing his degree, he consulted for clients such as the World Bank, the UN Development Programme, and the U.S. Millennial Challenge Corporation on numerous projects. He was

recruited by the Joint Warfare Analysis Center (JWAC) as an Operations Research Systems Analyst (ORSA) immediately following his graduation.

Dr. Damron discussed anonymizing technologies and additive manufacturing and how they combine to "change the game" of small arms and light weapons (SALW) proliferation.

When online anonymity, like the Tor Project, and anonymizable currencies, like Bitcoin, are combined, it allows buyers, sellers, communications, and economic transactions to be anonymized. The ability for websites to "live in" the Tor environment is what makes the technology so game changing with regard to SALW proliferation, because it allows buyer and seller to remain anonymous from one-another. Currently, relatively few large-scale traffickers dominate the illicit distribution of SALW. This is unlikely to change; however, traffickers of SALW can benefit from online anonymity and anonymizable currencies by using them to reduce their vulnerability. Suppliers will also see that there are potential revenues to be made in supplementing large-scale transfers by selling smaller quantities of arms (Chris Anderson's "long tail" idea applied to weapons).

The greatest points of vulnerability in any such system are the points at which the digital world intersects with the physical one because it is there that anonymity is jeopardized. To the extent that communications, transactions, and delivery of goods and/or services can be fully executed within an anonymized system, then, vulnerabilities are limited.

Thus far, the delivery of physical goods remains outside the anonymized system and is the point of greatest vulnerability. But how long will this last? Additive manufacturing ("3D printing") may change this. It exerts its most significant effects through three major mechanisms. The first mechanism is cost reduction. The broader adoption of 3D printing technology into the home and office is made possible by reductions in its cost. This is true for both current single-plastic systems and industrial-grade metal printing. Cost reduction also factors in on a per-unit basis to enable economies of scale later on. The second mechanism is the enablement of nonphysical distribution networks. Distribution of physical goods will shift from physical (shipping/smuggling) to nonphysical (computer) networks, leading directly to a number of significant ramifications. This will occur as 3D printing technology becomes more widely adopted, software becomes more user-friendly, and open-source plans become freely available. The third mechanism is the extension to other materials. As 3D printing is applied to other materials, more types of goods become digitally distributable. Explosive chemical compounds may be fully printable in the future, as well as embedded electronics and optics.

Bitcoin and Defense Distributed: An Example of How These Technologies Interact. As of September 2012, at least $17,000 of the $20,355 raised (approximately 85%) by Defense Distributed, the group whose stated goal was to produce a 3D-printable gun, had been donated in Bitcoin. As of May 2013, 99% of the group's assets were Bitcoin. As of March 2013, Defense Distributed was grossing over $6,000 per month and was hiring to start a for-profit computer aided design (CAD) search engine.

The Effects of Regulation. Once government began seeking to regulate Bitcoin, cryptocurrencies proliferated. Although each is limited in circulation and direct exchangeability for goods and services, they are usable as long as they can be converted into other, more widely accepted currencies.

Anonymity Employed. Strongbox is an implementation of "DeadDrop," an open-source system conceived and designed by prominent hacker Aaron Swartz. It was launched in May 2013 and is now used by the New Yorker to protect its sources, even from government requests for information. Strongbox's step 01 is to "Access the Tor network."

Discussion

Would a tool like Strongbox prevent reporters from verifying the veracity of a source?

Dr. Damron responded that it would and could break the trust bond between reporter and source, but it could also be a tool used for sources to provide anonymous tips. It could also be used by a reporter for "plausible deniability;" that is, to allow the reporter to refuse legal requests for information about a source even if the reporter does indeed know the identity of the source.

How will TCOs react once tools like Bitcoin and 3D printing become widely available and accessible? These tools will directly impact aspects of a TCOs illicit activity.

Dr. Damron noted that weapon trafficking is not going to be immediately devolved and decentralized from the people making the weapons, but it will represent a challenge to TCOs by potentially limiting their earnings from weapons trade. How the TCOs react to this is something that we will need to pay attention to. The TCOs will likely seek alternative sources of revenue. It will represent a fundamental challenge for the TCOs. Additionally, once 3D printing becomes more widely available, it will become easier for rogue acts of terror to occur. This will have an effect on how we think about stability.

How do the DoD, COCOMS, and Interagency synchronize and coordinate their TCO planning and operations? Are there gaps where the DoD can provide insight and/or assistance?

Mr. Chavarro noted that he has been part of a TCO workshop that is trying to answer these questions. There are a number of areas where the DoD can provide helpful collaboration. One of these is with training activities and exercises. Additionally, from an intelligence perspective, the DoD has platforms that are very useful, which the FBI has been working with. In the past, the DoD has also been very helpful in assisting with equipment and personnel transfers. Collaboration is crucial and will hopefully continue to improve.

Dr. Damron noted that USEUCOM has the Joint Interagency Counter-Trafficking Center to work on and continue to improve Interagency collaboration.

Mr. Pearson added that the USNORTHCOM CTF program works closely with USSOCOM/J-36 on CTF and C-TCO planning. In doing so, USNORTHCOM inserted CTF language into its plans

and operations orders, as well as worked with OSD, the Joint Staff and other combatant commands to write strategies and develop substantive metrics that support interagency collaboration to combat TCOs. USNORTHCOM also provides military capabilities to law enforcement through its component, Joint Task Force – North, which matches partner support requests to military resources while at the same time affording augmentation of military training. It is an easy win-win for national security and for both DoD and law enforcement partners. Collaboration is important and is something USNORTHCOM will continue to do and improve upon as it works with USG and host nation partners.

Invited Speaker Brig Gen Timothy Fay (JS, J33)

Brig. Gen. Timothy G. Fay is the Deputy Director, Command, Control and Nuclear Operations, Joint Staff, the Pentagon, Washington, D.C. He is responsible for advising the Secretary of Defense, Chairman of the Joint Chiefs of Staff and the Joint Staff Director of Operations regarding nuclear, space, and missile defense operations as well as all aspects of the National Military Command System.

Brig. Gen. Fay thanked Dr. Cabayan for inviting him. SMA conferences and workshop are the rare places where you see representatives from academia, industry, think tanks, FFRDCs, and operators come together to address wicked problems. It is extremely unique.

Earlier in the workshop, representatives from the COCOMs spoke about their requirements and challenges. Yet no one has yet brought up nuclear deterrence, but it is one area where the DoD needs SMA's help. It is a difficult topic and often misunderstood, yet the SMA network contains some of best thinkers we have on the topic.

One of the biggest challenges of nuclear deterrence is the lack of articulate, informed discussion and research about it. There is a dearth of discussion, thinking, strategy, and tactics. It is largely absent from academic discussions. However, where it is not absent is in the op-ed pages of the New York Times.

A recent op-ed entitled "Ending Nuclear Overkill"[4] provides a great set up for this discussion. The article shows us that urban legends continue to drive the debate about nuclear deterrence. One urban legend is that we no longer need or use nuclear weapons. However, the reality is that the DoD uses its nuclear arsenal 24/7, 365 days of the week. There will never be a massive confrontation where the adversary does not account for the U.S. nuclear arsenal on alert. Furthermore, U.S. submarines are continuously deployed and survivable. The U.S. bomber force is visible to our adversaries. Strategic weapons are made for deterrence. We use these weapons every day. They are effective and a part of our adversary's decision calculus.

[4] Friedman, B., & C. A. Preble. (2013, Nov 13). "Ending Nuclear Overkill." *New York Times.* Retrieved from http://www.nytimes.com/2013/11/14/opinion/ending-nuclear-overkill.html?_r=0

Some say that the USG can no longer afford strategic weapons. But what is a better return on investment than the B52 fleet built in 1951? That is unbelievable return on investment and continues to be so. Furthermore, only three percent of the Air Force budget goes to support one leg of the triad.

The Cold War argument is more complicated. In 1990, the USG had a large number of weapons. Since then, the number of weapons has decreased treaty after treaty. The USG has radically adapted our strategy. We have taken bombers off alert. Numbers of weapons have been drastically reduced. We have revised nuclear policy and strategy in line with the reduction.

The challenge facing the DoD today is how to further adapt policy and strategy in alignment with a smaller arsenal and a more uncertain world environment. The international system has changed significantly since the Cold War. We need to understand how we deter our adversaries with and without nuclear weapons. How do we deter an attack against not only ourselves but our allies as well? We should be looking at that more carefully.

The nuclear triad was never a strategy; it was a means. It continues to be a means today. It has attributes that make U.S. response flexible and agile. Each leg is worthy of discussing. ICBMs are essential for responsiveness and flexibility. Because of where ICBMs are located, would it be possible for the adversary to surprise us? If you took ICBMs offline, it would result in much reduced strategic targeting. You then incentivize what you fear.

One fear of decreasing the U.S. arsenal is that it could reach a level where it loses deterrence value and contributes to instability. Nuclear deterrence provides strategic stability in the international environment. Another concern is that regional players may disrupt strategic stability between major international players. Dozens of nations likely have the capability to produce nuclear weapons. A large number are U.S. allies. They count on our assurance as their umbrella, and many are in tough neighborhoods. The USG has to provide strategic stability and deter near peer adversaries. SMA has done some great work to contribute to this conversation, but there is a lot more that needs to be done.

Discussion

Brig. Gen. Fay spoke about strategic deterrence and its efficacy in deterrence. How credible is our strategic deterrence against tactical nuclear weapons?

Nuclear weapons are designed to deter.

How low can the nuclear arsenal go and still have second-strike capability? How low can you go and still have a strategic deterrence effect?

We do not know that answer to that question—it is one of the key questions of the 21st century. What helps is to give policy makers and leaders a range of options so that we have

the right resources for the right threat. The folks in this room can help us answer these kinds of questions.

Are we changing our adversaries' deterrence calculus due to our advancing conventional capability?

The biggest issue in conventional capability today is missile defense. It absolutely changes our adversaries' decision calculus and we are struggling with that today. From our perspective, deterrence is about communication. It has to be perceived and understood.

Can nuclear weapons deter a NSA?

Nuclear weapons did not protect us from 9/11, but neither did conventional weapons like aircraft carriers, tanks, and Special Forces. After spending time in Iraq, it became clear to me that some people are not deterrable in the traditional sense. We struggle with this.

Panel Six: A Sociotechnical World: A New Era of Disruption and Opportunities for Innovation (Moderators: Dr. Val Sitterle, Georgia Tech & Maj David Blair, Georgetown University)

The rapid and continual coevolution of the social and technological sectors is creating a globally pervasive sociotechnical ecosystem. A significant challenge as we seek new and innovative methods to operate in this world is that the sociotechnical ecosystem is not readily or even correctly reverse-separable into its social and physical components. New capabilities, uses, and context are being created continuously. The result is not simply a difference in scale and speed but rather a 'difference in kind'. Operational dynamics and social processes, their outcomes, and even traditionally held concepts of stability are morphing away from what we have understood. This panel will discuss the nature of the sociotechnical dynamic, ensuing strategic and operational considerations, and potential approaches that will help us address its challenges:

- Our current and future security challenges inherently stem from a complex, social-psychological emergent ecology of conflict that is exacerbated by the sociotechnical coevolution. How can the lens of 'social change' help us understand the ongoing transformation of conflict and building peace?
- Today's conflict is simultaneously local and global. How does this evolving dynamic create new operational concerns and aspects of strategic surprise, especially in the sense of population influence and mobilization dynamics?
- How does the rapid emergence of a true sociotechnical ecosystem challenge our abilities to forecast and anticipate critical points of instability?
- How might concepts of disruptive and innovative IO address influence in the evolving socio-CBCT ecosystem and offer a way forward?

Panel Members:

- Dr. Dana Eyre, System of Systems Analytics (SoSA), Inc.
- Mr. Gerald Scott, NPS
- Dr. Regan Damron, Booz Allen Hamilton/USEUCOM
- Mr. Alex Cochran, BAE Systems

Dr. Val Sitterle, Georgia Tech Research Institute, co-moderated the panel. *Dr. Sitterle is a Senior Researcher in Applied & Transdisciplinary R&D at the Georgia Tech Research Institute. She has over 15 years experience in defining, executing, and leading applied science and engineering R&D efforts, primarily in the defense and biomedical domains. She is currently working to develop frameworks and analytics that help capture sociotechnical dynamics as well as methods that couple complexity approaches with design and characterization of cyber-physical systems. Sensor/protection platforms are a primary emphasis, and her work includes broad-spectrum evaluation and Red/Blue teaming analyses for Improvised Explosive Device (IED) and Counter-IED (C-IED) technologies. She has developed sociotechnical and risk assessment frameworks for global manufacturing applied to defense systems, and currently performs systems engineering analysis and design for Engineered Resilient Systems (ERS). These efforts have supported various DoD organizations including the U.S. Air Force, U.S. Army, Joint IED Defeat Organization (JIEDDO), and industry partners.*

Maj David Blair co-moderated the panel. *Major David J. Blair is a Ph.D. Candidate studying International Relations at Georgetown University. Most recently, he served as Assistant Operations Officer (Warfighting) for the 3rd Special Operations Squadron, 27th Special Operations Wing. Responsible for Tactics, Plans and Intelligence, he integrated the operations of America's premier Predator squadron with Elite Special Operations Forces worldwide, in standing and emerging theaters. Captain Blair is an instructor pilot in the MQ-1 Predator and an AC-130U pilot. He has served as RPA Liaison Officer, sole RPA Subject Matter Expert, and Acting ISR Battle Captain in Joint Special Operations Task Forces on multiple occasions. With more than a thousand combat and combat support hours in the MQ-1 and the AC-130, Captain Blair is a veteran of Afghanistan, Iraq, and the Horn of Africa.*

Dr. Sitterle discussed the complex sociotechnical ecosystem with respect to its characteristics that have tremendous bearing on operational and especially Phase 0 dynamics. She explained that 'sociotechnical' is more than simply 'social and technical' and that, instead, the social and technical dimensions have merged to create a complex ecosystem that is continuously evolving. The inherent complexity is created through the interactions of multiple, heterogeneous elements with each other and the environment to create system behaviors and characteristics not found at the individual level. Our abilities to model, analyze, and predict behaviors of complex systems are inadequate, which often leads to either incorrect oversimplification or the perception that complex systems fail. Especially in the case of complex sociotechnical systems, where coevolution is tied to aspects such as innovation, what came before is no longer an accurate basis on which to forecast what

comes next. These characteristics challenge our abilities to develop the necessary understanding and meaningful insights we need operationally.

To help elucidate why the sociotechnical ecosystem is so difficult to capture through models or predictive types of analyses, Dr. Sitterle described the fundamental differences between complex systems and complex systems with humans. A generalized complex system entity adapts its response to input, but the possible responses are bounded and how the rules change—if at all—is similarly bounded. When humans are added, the human adapts its response to input, but there is a much broader range of impactful inputs and possible responses. In a complex system with humans, rules change with time, and nuances begin to matter. Responses may no longer be proportional, and new actions (response outputs) can evolve.

The sociotechnical ecosystem we face today is not reverse-separable into social and physical elements; yet, it wields significant influence on more socially attributed dimensions of stability. Conflict is now simultaneously global and local. The evolving sociotechnical ecosystem is transforming temporal and spatial characteristics from individual to trans-state behaviors, simultaneously creating new paradigms for emergence and support of terror activities on a global scale. Innovation, for all of its unpredictability, becomes a driving factor in the continual co-evolution of this space.

So, what does this mean for us? Do we need to focus on technology or people? How do we determine new ways in which we are at risk? What can we do about them? How do we operationalize the concepts? These are important questions for us to understand.

Dr. Dana Eyre, SOSA

Dr. Eyre is a sociologist specializing in the analysis, planning, coordination, and evaluation of social change and strategic communications activities. He holds a PhD in sociology from Stanford University. A former infantry and civil affairs officer, he has been a faculty member at the U.S. Naval Postgraduate School, George Mason University, the U.S. Military Academy, and the Pearson Peacekeeping Centre in Canada. After working for the United Nations (in Kosovo) and the U.S. Agency for International Development (in Iraq and Washington, DC), he held a Jennings-Randolph Senior Fellowship at the United States Institute of Peace. His project experience ranges from the Balkans to Afghanistan to Papua New Guinea and he has supported peace building and counter-radicalization projects for Somalia, Pakistan, and the wider Middle East. At SOSA, he leads efforts to apply advanced analytical techniques to understanding and effective action in human domain problems.

Dr. Eyre discussed bringing the "socio" back into "sociotechnical" analysis. Ideas and concepts are the lenses with which we see the world. They are the fundamental aspects of social science.

All of our current security problems are social change problems. People tend to get uncomfortable when talking about social issues like class, but if they get uncomfortable when thinking about class, how are they going to think about globalization? Globalization is

ultimately a function of class. Globalization is a fundamental social restructuring at the global level. We need to get conceptual clarity in our lenses. We are always engaged in the world we are trying to understand and this we must confront.

It is crucial that we understand the full social realm—narratives, networks, interests, identities, vocabularies, desires, and disgusts. Social scientists tend to work in only one of these areas, but if we are going to understand the world we need to understand the way that all of these things interact in the social realm. There are cultural dynamics that drive evolution of technologies as much as the actual technological problem.

What we are confronting today is that we have Stone Age emotions, medieval institutions, and Star Wars technology. We have a Constitution that is the cutting edge of mid-18th century political thought and our national security analytical vocabulary is the intellectual pride of the post-Napoleonic era.

To truly understand the sociotechnical system, we must realize that it is the dynamics of the "socio" that are the deep currents. The gap between the stories we tell ourselves—our institutional structures—and the underlying dynamics of life is what we need to understand.

Fleet Admiral Chester W. Nimitz once said, "The war with Japan had been enacted in the game rooms at the War College by so many people and in so many different ways that nothing that happened during the war was a surprise—absolutely nothing except the kamikaze tactics toward the end of the war. We had not visualized these." We spend most of our time remodeling our institutions, but surprise is not going to come out of the technical realm. Surprise comes from the blind spots in our thinking—from the spaces we are uncomfortable or those spaces that challenge our cultural truths.

Mr. Gerald Scott, NPS

Mr. Gerald ("Scotty") Scott is a Research Fellow and PhD student in the Information Sciences Department at the Naval Postgraduate School (NPS) in Monterey California. At NPS he manages the OSD-Sponsored Joint/Interagency Field Experimentation Program and conducts inter-disciplinary research in Information and Influence Operations, multi-level security computer systems, and decision-making in complex environments. Scotty is a retired Army Lieutenant Colonel. While on active duty he served as an Air Defense Officer in Europe and the Middle East and as an Information Operations Officer in the Middle East and the Pentagon. Scotty received and MS degree from NPS in 2003 in National Security Affairs, with and emphasis in Information Operations and Interagency Cooperation.

Mr. Gerald Scott, Naval Postgraduate School (NPS), discussed the meaning of sociotechnical. He began by presenting a scenario for someone who is currently 10 years old. This person, who was born in a megacity into what we would consider poverty but would likely be considered the middle class inside of the megacity, does not have access to good education, family wealth, or an industrial base. As a result, our projection for this person's future

would likely be a somewhat dismal continuation of poverty. However, if this person was given access to the Internet and a smart-device (IPhone, IPad, etc.) their future could turn out much different from that of the projection.

Looking at this scenario from another perspective, this person likely already speaks two languages—speaking multiple languages is becoming more common in the current era. Since the person has access to the Internet and a smart-device, he/she has access to free, world-class education online. Although this person may not have access to banks, he/she can use the Internet to create a Bitcoin wallet. This person can then sell his/her intellect or knowledge on the global market with almost no barrier to entry, and in doing so this individual can rise out of poverty without any help from the government.

This scenario portrays the importance of understanding sociotechnical identities. Typically, community is viewed as the people in a geographic location. However, this individual's community is not the people that are around him/her in the megacity. Instead, this person's community is online. This person's peer group is the relationships that he/she built online, which is globally interconnected.

We need to rethink the concept of the nation-state. If people's identities from birth are becoming extra-national then the whole construct of the international system will eventually be challenged. Is the nation state construct going to remain the same in the next 30 years? It is probably unlikely. The youth of today are not tied to the nation state or government structures. People's identities are no longer tied to the political system. There is much less reliance on the state today than there has been in the past. Sovereignty is going to continue to decrease in the future.

The question becomes, how does the United States operate in this changing environment and what does this change mean for stability? Stability needs to be defined as the ability to adapt to a changing situation. The new status quo is that there is no status quo.

Dr. Regan Damron BAH/USEUCOM

Dr. Regan Damron, a consultant with Booz Allen Hamilton (BAH), is currently providing methodology development and analytic support to U.S. European Command (EUCOM) Strategic Foresight on-location in Stuttgart, Germany, where he has published Unclassified papers and briefs on subjects ranging from online anonymity and additive manufacturing to weapons and drug trafficking and the "New Silk Road(s)." He holds a Ph.D. in Comparative Politics, International Relations, and Methodology from The University of Georgia. While finishing his degree, he consulted for clients such as the World Bank, the UN Development Programme, and the U.S. Millennial Challenge Corporation on numerous projects. He was recruited by the Joint Warfare Analysis Center (JWAC) as an Operations Research Systems Analyst (ORSA) immediately following his graduation.

Dr. Damron noted that connectedness is crucial and underpins the current era. Connectedness is what makes mega-issues and mega-events possible. When talking about the framing of problems on a global scale, it is the awareness of the problem that makes it

mega. Connectedness means tighter lines of transmission. If envisioning nodes linked by a wire, connectedness makes the distances between the nodes shorter, which means greater velocity of travel, effects in the system, and actions taken, and they become more harmonic, which creates greater magnitude of effects. Connectedness also leads to a greater sensitivity in the entire system.

Bitcoin and 3D printing are changing the sociotechnical environment—people are using Bitcoin to send money to less developed countries, Iranians are using Bitcoin to usurp sanctions, and 3D printing has even been introduced in Africa. So, what does this mean for forecasting? We need to shift the focus away from proximate causes and stop obsessing about finding the immediate cause of a particular event. We need to start focusing on understanding the environment, incentive structures, and context of events. How would we go about doing this? We need to combine the best of qualitative and quantitative methods.

First start with a research question. The research question bounds the problem set. It is important to look at the strongest ties and highest probability events, but a boundary must be defined. Next, examine past trends and look at variables and the relationships between those variables over time. Once those relationships are identified, look for the key points in time when those relationships may have changed. These shifts can be used to understand the balances. Once the trends and shifts are identified, this information can be used to inform a qualitative "what if" analysis. This will help in thinking about the types of things that could occur that could change the present relationship between variables. Then, possible game changers could be identified and interfaced with knowledge and, based on these game changes, a risk-based analysis can be run. This will allow for the extrapolation of timelines based on what is relevant.

Mr. Alex Cochran, BAE Systems

Mr. Alex Cochran currently serves as Director of Maryland Operations for the Global Information Technology Solutions Business Area of BAE Systems' Intelligence and Security (I&S) Sector. Prior to his current position, Alex focused on Cyber and Signals Intelligence strategy development for I&S. Alex Cochran is a retired Army Colonel of Military Intelligence with extensive experience across the Intelligence Community and Department of Defense specializing in Cyber Operations and Signals Intelligence (SIGINT). Alex finished his 25 year Army career as the Director of Army Cryptologic Operations, the Army's senior Cryptologist responsible for Army SIGINT globally and principal liaison to the National Security Agency (NSA). Alex played a critical role in the standup of both U.S. Cyber Command and U.S. Army Cyber Command. Most recently, Alex served as NSA's senior military representative in Afghanistan, responsible for all of NSA's operations in support of Commander, U.S. Forces Afghanistan.

Mr. Cochran stated that history does not repeat itself but it is the lens through which we see the present day. Mr. Cochran emphasized three points. First, the rise in relevance of this sociotechnical world in the open source is meaningful to inform U.S. intelligence. Second,

things are not always going to stay the way they seem. The foundation of the Internet has been one of the most fundamentally disruptive events since the discoveries of language and the Western Hemisphere. Finally, the new cyber realm in which we are operating needs to be classified as a domain. It is a manmade domain that we can change.

Discussion

Maj David Blair, Georgetown University, concluded with a few summary remarks. First, the technological evolution is not deterministic—all of these technologies are culturally situated. The cultural contingency is rooted in unknown unknowns. In thinking about institutional culture, how do we avoid this trap? Second, all technology is culturally loaded. Is it possible to actually take technologies and reshape the world through formal means? Third, the idea of connectedness is fascinating. Connected worlds show up on numerous occasions throughout history. Finally, given that relationships are far more important than skillsets, how do we think this through as an institution for planning?

A lot of work focuses on projecting into the future from the current model, but the youth of today are already in this future. No one is looking at the current model and working back. Many things being discussed today are already 10 years behind. The nation state model is already dead.

Mr. Scott agreed and noted that this is in large part due to a false sense of diversity that we maintain inside of our isolated culture. The under 25 youth population is already living in the post Westphalian world. These youth do not identify with the nation state like the older generations. Most of the world does not feel the authority and legitimacy of national state government.

The panel then posed a rhetorical question to the audience: What is the new 'Westphalia'? If the current nation-state concept with all of its structure and static rigidity is already being demolished, then what is next? There will not be a complete vacuum, even if what is 'next' is itself a continuously changing concept. Can we anticipate any degree of this and what it might mean for our operational concerns?

Mr. Cochran added that visualization and modeling technologies exist today that enables us to do these projections. The technology exists for modeling effects, which can then be used to understand impacts at the socio-cultural level.

Dr. Eyre noted that it is not that the future is here currently; rather the youth of today plays an instrumental role in the future and its dynamics.

Mr. Scott added that we must improve our literacy in the sociotechnical realm. If you understand the sociotechnical realm as Facebook and Twitter then you are already five years behind. We need to provide our forces the means to do this. We need people that actually know what is going on in the sociotechnical realm because unfortunately we do not have many of these people.

What are the current efforts to assess technology development given the operational gaps?

Dr. Sitterle responded that in looking at Bitcoin, it was not simply a technology or the people that created the completely new dynamic that is Bitcoin. Instead, it was the coevolution where the people evolved the technology counter to the status quo. The innovation dynamic where new ideas and capabilities continuously spawn other new ideas and capabilities renders the problem un-separable and prevents explicit predictability.

Dr. Damron added that one plausible way ahead could be to look at population sentiment and try to vector the types of technology that they might find useful or appealing.

How do we look to see what is going to happen down the road so we can gather the intelligence beforehand?

Maj Blair noted that this is in the DNA of innovation. We need to start rewarding people for bringing up "black swan" ideas rather than ignoring them.

Dr. Damron added that there is a ton of data that exists but the question that remains is how to mine and share access to that data.

Invited Speaker: Lieutenant General Robert E. Schmidle Jr., USMC

Lieutenant General Robert E. Schmidle, Jr., USMC, serves as the Deputy Commandant for Aviation. As the Deputy Commandant for Aviation, he sets policy and facilitates the manning, training and equipping of Marine Aviation units. His command assignments include Commanding General of First Marine Aircraft Wing, Commanding Officer of Special Purpose Marine Air-Ground Task Force (Experimental), and Commanding Officer of Marine Fighter/Attack Squadrons 251 and 115. Previous operational assignments include multiple tours flying the F-4 and F/A-18 aircraft as well as serving as the operations officer and air officer of an Infantry Battalion, First Battalion 9th Marines.

LtGen Schmidle spoke about the intersection of national security and universal moral principles as a filter through which national security strategy is developed and executed. He discussed whether human nature is universal and whether it implies certain rights and duties. Universality is related to both objectivism and relativism in philosophy. Phronesis is the relationship between a 'universal' and its application in principle to a particular situation. The result of this process of mitigation is phronesis or practical knowledge. It has a relationship to the principle, but it leaves neither unscathed.

The issue here is whether or not there is an immutable, universal moral principle regardless of situation that could or should inform moral choices. The notion of phronesis, or practical knowledge, came from that mitigation of the universal and the particular. Some say the admonition not to kill is a universal principle, yet killing in self-defense is sanctioned.

In the 18th century, Immanuel Kant suggested that reason should drive all of our actions. This "enlightened" idea is evident today in analyzing the actions of policy makers who largely believe that if the major players in a conflict could sit in a room together and talk that they could arrive at a reasonable and agreed way forward. The notion of individual rights and the categorical imperative (one should act as if the maxim of his actions should be applied universally) emerge from this notion of rationality. However, man can reason his way through anything.

The French Revolution provides an interesting case study. The French went from monarchy to the Reign of Terror to an emperor. Meanwhile, the American Revolution is an example where we did not go back to the same kind of government as before the revolution. Kant's influence is enormous in American culture. It influenced the drafters of the Declaration of Independence (e.g., inalienable rights). A belief in individuality and individual rights pervades American culture.

Ludwig Wittgenstein had a theory about moral hinges. Hinge beliefs are the things we just know, on which our form of life turns. They are non-epistemic and non-experiential. They are the practices that define a culture. If I develop a national security strategy that is going to have my country interact with another country and I do not understand what kind of hinge beliefs drive that other culture, I will be at a disadvantage from the beginning.

Over time, we see the tendency to focus on universal principles particularly moral ones, which I argue do not exist. The belief in universal moral principles can be seen in jihads and crusades. The way we view moral principles has a significant effect on how we view the world.

Some say human nature is the same the world over. I am not sure that is true. It is difficult, if not impossible, to discern the essence of human nature because we see the world through individual filters. If one universal principle prohibits killing, why are some forms of killing acceptable? We choose culture; culture does not choose us. Some feel that it is irrational for some people in the world to hate Americans, but rationality is relative. When you start labeling a concept as universal, you start immediately restricting the art of the possible.

A duty is a demand that others put on me. A right is something that we demand from others. For example, Americans have the right to vote; it is not a duty. However, if you were a firefighter and you drove past a burning building, you have a duty to get out of your car and help. If I am not a firefighter, I may not feel a duty to fight the fire because I have not accepted that duty. Individual beliefs emerge from social beliefs. The more individuals become concerned about rights, the more individualized we become as a society. What does having a right imply about duties? A right without a duty is inconsistent.

If you look back in history, you might wonder why there was so much resistance to women's suffrage. It was because the people who governed saw it as a threat to their right to govern the country. For universal suffrage to become part of the culture, the people who were the only purveyors of that right had to give it up. We are transitioning to an era where

we are more concerned about individual rights than duty. JFK's famous line, "ask not what your country can do for you, ask what you can do for your country," was an attempt to invert the trend towards individual rights.

The concept of rationality does not line up with the way we really interact with each other. One philosopher said that enlightenment brought about a "prejudice against prejudice." We cannot bracket out prejudices. Perhaps we should use them as filters. Accept your prejudices and put them out in front of everyone. In that way you allow your prejudices to be challenged, but you cannot get there without acknowledging your filters.

We need to come to a better understanding of the relationship of principles. We tend to confuse things like democracy with voting. People have a right to vote, not a duty to vote. Therefore, the number of people who voted is not a good measure of democracy. As we accuse others of irrational behavior, it reflects our inability to understand the relative nature of rationality.

The search for universal principles is debilitating to our ability to come up with a coherent national security strategy. If you start with the notion that there are universal principles based on rationality, you will find yourself in a frontal assault on irrationality. The enemy then seems irrational and the proposed solution is to make them understand. However, if you listen to their leaders, our experience tells us that reason does not answer the questions we have. Our lives do not occur rationally. There is randomness and chance. Even Clausewitz devoted an entire chapter to chance because at the end of the day, he could not map rationality to warfare. The more you try to see things in terms of rationality, the more restricted the options are at the end of the day to develop a coherent strategy.

In sum, if we go searching for principles, we cordon our position into intellectually comfortable camps of rational beliefs. We can defend those camps with reason, but it creates additional barriers so that we will not be able to understand other potential strategies.

Discussion

Economists believe that all beings are rational. If someone is behaving irrationally, it is because the analyst has not understood why the behavior is rational from his or her perspective.

The question would be, why would an individual do something irrational? What you said is what we intuitively know.

How should national strategies address an actor that seems to be acting irrationally?

In 1950, Khrushchev took off his shoe and started pounding it on the table. We thought he was crazy. It was not until several years later that we put in a hotline with Russia and began seeing Russians as rational. It would help policy makers to embrace that there is no

common rationality. We have to grow leaders that think broadly enough to go outside their own bubble to get information. The first part is understanding that we all carry prejudices.

In the last year, there have been several scandals within the U.S. Navy. As a senior leader, how do you see individual moral choices playing into leadership?

No one is immune from irrational feelings. Football players think they have a right to drink underage. Does that instill duty placed on you by others? We should talk about rights and duties together. With a right comes a duty. Rights are things we accept—tacitly or not.

Maybe the distinction is better understood in terms of privilege and duty. Wearing a uniform is a privilege, not a right. There is duty too as the community has a right to expect certain behaviors from people in uniform.

That is a good point. Different tribes hold different standards. Uniform military hold to standards not held by others.

How does this concept of rights and duties play out in the Snowden case? He is defending his rights to speech, but to do that, he had to violate his nondisclosure agreement.

To say that I have a right means that the person who owns that right gives it to me. I have a duty not to disclose information I have agreed to keep secret. The issue is how one manipulates things in his mind to fit the behavior they engage it. Is duty to society greater than my individual right to do something? The USMC does not privilege individuality, but Google does privilege individuality. It is cultural. When you sign something, you are freely taking on a duty.

Are hinge beliefs mutable in a globalizing world where different hinge beliefs come up against one another?

Beliefs are mutable. Our grandparents had no reason to believe than man could walk on the mood. There was a hinge belief that there were no people on the surface of the moon. We do not believe that now. It used to be a hinge belief that most terrorists were male, but the advent of the Internet means that more women can participate in terrorism. Technology can and does change culture.

What beliefs would you recommend to frame U.S. national security policy and strategy?

Tension between opposite forces is not always bad and they should not always drive towards synthesis. Synthesis is not always healthy for culture or policy. The ability of a culture to hold disparate notions in tension at the same time makes cultures vibrant. The willingness to bring disparate ideas into play without trying to synthesize them is a positive step toward coherent policy.

Panel Seven: Megacities in the 21st Century: Opportunities and Challenges (Moderator: Mr. Dave Browne, USPACOM)

Megacities are rapidly growing and changing population centers where urbanization is often far outstripping the ability of governments to enforce rule of law and provide basic socio-economic services, such as clean water, sanitation, etc. As a consequence of these deficiencies, these densely populated urban areas can become spawning grounds for public resentment, criminal activity, and political radicalization, which is a national security concern for U.S. policymakers. This panel will discuss and explore DoD operational needs for understanding megacities and other rapidly changing urban centers. The panel will begin with megacity and DoD operations definitions, followed by the framing of megacity socio-cultural understanding, and finishing with information collection, analysis, and visualization issues.

Panel Members:

- Mr. Doug Batson, NGA
- Dr. Allison Astorino-Courtois, NSI
- Dr. Karen Owen, GMU
- Dr. Charles Ehlschlaeger, ERDC
- Mr. Gerald Scott, NPS

Mr. Dave Browne, USPACOM, moderated the panel. *Mr. Dave Browne is the Deputy Chief of Strategy and Plans in the United States Pacific Command (USPACOM) Intelligence Directorate. He also serves as the program manager and senior analyst for USPACOM's Socio-Cultural Analysis (SCA) / Human Geography initiative. In this capacity, he leads intelligence support to Theater Campaign Planning and supervises the command's SCA program. His team is currently focused on developing methodologies to enhance military planning and provides direct analytic support to capacity building efforts and information operations. Prior to moving to USPACOM in 2007, Dave lived in the Washington DC metropolitan area where he specialized in strategic planning and organizational change management within DoD, IC, and USG organizations. Dave also served in a number of OIF/OEF deployments as a member of the U.S. Army Reserves. He attended the University of Pennsylvania, the Naval War College, and the Joint and Combined Warfighting School. He lives in Kaneohe, Hawaii with his wife Katy and his two children Elyse and William.*

Mr. Browne noted that understanding megacities is crucial. Urban areas are the key terrain of the future. It is also important to develop tradecraft and training to focus intelligence collaboration in general and with respect to megacity planning. The ultimate goal is to inform the Combatant Commands in three areas: strategic intelligence, whether we are performing and achieving our goals, and anticipatory intelligence. We need to capture expertise so it can be used by planners when it is needed the most.

Mr. Doug Batson, NGA

Mr. Douglas Batson joined the National Geospatial-Intelligence Agency (NGA) as a human geographer in 2004. He is a staff member to the Foreign Names Committee of the U.S. Board on Geographic Names, and in FY14, an Office of the Director of National Intelligence (ODNI) Research Fellow examining megacity governance. Batson has written extensively on the role of land tenure and property rights in U.S and United Nations operations. He holds a Master of Education from Boston University, a Bachelor of Science in geography from Excelsior College, and the German language diploma from the Goethe-Institut. He previously worked for the U.S. Geological Survey and Department of Justice. Sergeant First Class Batson completed a 22-year career in the U.S. Army Reserve as a Turkish linguist. He was awarded the Bronze Star Medal during Operation DESERT STORM.

Mr. Batson described megacities. Most geographers use the UN designation for megacities as cities with a population size of over 10 million people. Megacities are gigantic cities with overlapping structures. There are currently 27 megacities in the world, most of which are located in the developing world. However, by the year 2030, even Africa is likely to become majority urban. We have seen the future and it is most definitely urban.

There are three stages of urban environment transition in megacities. Megacities in stage 1 of the environmental transition, often in the developing world, face problems with solid waste management and access to clean water. Megacities in stage 2 of the environmental transition face problems with air and water pollution. Megacities in stage 3 of the environmental transition have overcome environmental problems and are sustainable cities.

The pace and scale of 21st century urbanization is unlike anything human history has ever witnessed. There is a lack of resources to keep pace with the 180,000 migrants that move to cities daily. Megacity governments are often unprepared for this rapid urbanization. The rapid urbanization of today is very different from the urbanization that occurred in the industrialized world 100 years ago when people benefitted from urbanizing. Today, there is often little or no governance in megacities. If there is no good governance, someone will fill the gaps and often times these gaps are filled by non-state actors with nefarious intent.

Developing world megacities thus far have been surprisingly resilient, but the potential for a natural disaster or threat to sovereignty from a non-state actor loom. Megacities are new phenomena and must be understood for future U.S. defense and diplomacy actions.

Dr. Allison Astorino-Courtois, NSI

Dr. Allison Astorino-Courtois is Executive Vice President at NSI, Inc. She is also co-chair of a National Academy of Science's study on Strategic Deterrence Military Capabilities in the 21st Century. Over the past five years, Dr. Astorino-Courtois has served as technical lead on a variety of rapid turn-around, Joint Staff-directed Strategic Multi-layer Assessment projects in support of U.S. forces and Combatant Commands. These include assessments of key drivers of political, economic, and social instability and areas of resilience in South Asia for USCENTCOM,

USPACOM, and the intelligence community; development of a methodology for conducting provincial assessments for the ISAF Joint Command; production of a "rich contextual understanding" (RCU) to supplement intelligence reporting for the ISAF J2 and Commander; and two projects for USSTRATCOM on deterrence assessment methods. Previously, Dr. Astorino-Courtois was a Senior Analyst at SAIC (2004-2007) where she served as a STRATCOM liaison to U.S. and international academic and business communities and reviewed documents and analyses related to the Deterrence Operations Joint Operations Concept (DO-JOC). Prior to SAIC, Dr. Astorino-Courtois was a tenured Associate Professor of International Relations at Texas A&M University in College Station, TX (1994-2003) where her research focused on the cognitive aspects of foreign policy decision making. She has received a number of academic grants and awards and has published articles in multiple peer-reviewed journals. Dr. Astorino-Courtois also has the distinction of having been awarded both a U.S. Navy Meritorious Service Award and a U.S. Army Commander's Award. She has also taught at Creighton University and as a visiting instructor at the U.S. Military Academy at West Point. Dr. Astorino-Courtois earned her Ph.D. in International Relations and MA in and Research Methods from New York University. Her BA is in political science from Boston College.

Dr. Astorino-Courtois discussed the reasons why megacities need to be looked at systematically. Megacities are not just cities of a large size. They are a new, distinctive spatial form. They constitute a complex unit of production, a single labor market, and a specific system of power, beyond their extreme cultural and social differentiation. As for the rest of the country, it increasingly becomes the hinterland for the functions and power that emerge from megacities.

Megacities are typically considered to be a development issue. However, there are issues within megacities that are of particular interest to the DoD.

- Some research indicates that megacities are microcosms of the state and sources of instability or growth may be observable in the urban setting before they are observable in the state.
- Humanitarian crises in densely populated areas can be more damaging and the effects felt quicker and longer.
- Mass cities are difficult and, until recently, under-studied terrain. Because of proximity, communications networks are different and often less visible than in other areas. Maps of megacities often show slum clusters—unofficial neighborhoods—as uninhabited space when in fact thousands of people live there. New means and patterns of social organization are occurring in rapidly growing megacities that defy western models yet seem to work.
- The sheer size and growth rates of megacities can easily overwhelm governing institutions and public services—especially in the developing world—creating a new type of ‘urban ungoverned space’. However, if we include the possibility of unofficial governance, there are very few truly ungoverned spaces in the world. When a government is overwhelmed non-state actors enter and fill the void by providing social goods like order, security, and economic assistance. These non-state actors could have nefarious intent.

- Criminal and extremist elements can thrive in the vast informal settlements and economies that accompany rapidly growing cities.
- Movement from a rural setting to a dynamic urban landscape often means leaving behind social and familial networks and can result in marginalization of large groups of people, social uncertainty that can foster unrest, and violence among frustrated residents.
- Areas where governing institutions are overwhelmed means that services like water, security, etc. are not provided equitably, but also that major portions of the economy and its labor force can go unregulated. From a tax perspective, this may be a good thing for business, however, few business ventures can or will undertake the huge infrastructure projects—and the maintenance of transportation, distribution, and energy infrastructure that are the engine of economic growth and sustainment.

Getting imagery or other data about a megacity or conducting analyses of facets of the city are important steps in enhancing understandings of the degree to which these agglomerations do represent "distinct spatial forms" in the context of U.S. national security concerns. Key aspects of city life and stability cannot generally be studied from overhead alone, developing an understanding of political and social perceptions, political institutions and service provision, interaction effects and secondary consequences, and social and economic resiliencies is crucial in order to fully understand megacity dynamics. Robust conceptual models can be helpful in facilitating assessments and analyses of complex social, political, and economic systems by

- directing data collection and analysis making it more efficient and less costly;
- facilitating development of a common operating picture (COP) that is readily transportable across analysts, departments, and agencies; and
- aiding in identification and analysis of non-intuitive relationships between factors (2nd to nth order effects) in complex systems.

In order to turn individual aspects of the picture into actionable knowledge, a comprehensive and fully articulated analytic model is required. This can be thought of as the border pieces of a puzzle. It is much easier to put the pieces together once the border is complete. A completed puzzle border provides a sense of the size or scope of the puzzle that is being worked, and areas that look promising as places to begin the job of uncovering the hidden picture. This is essentially the role played by an analytic framework.

There is a need for a planning support framework—a model that marries the benefits of rigorous critical thinking with the applied setting in which planners and operators work. We need to find a way to fuse these two aspects. NSI and USPACOM are working to fuse together NSI's Stability Model, which produces strategic and policy-level insights about the interdependent social, political, and economic systems of a nation-state, city, or other collective, with the USPACOM SCA framework, which facilitates tactical COCOM mission oriented analyses from the quick triage to detailed analyses. This effort is working to bring the frameworks together to facilitate data sharing and common collection, collaboration,

and to expand the range of questions that any single framework alone can address—that is to use the data gathered in a number of ways depending on the needs of the consumer.

Dr. Karen Owen, GMU

Dr. Owen works as a strategist, analyst, and scientific researcher in the field of human geography. She received her PhD in Geography and GIS from George Mason University and has published in the scientific literature on geographic access to healthcare, informal settlement differentiation from imagery, and image-based metrics to evaluate slum severity in developing countries. Her latest research includes remotely measuring neighborhood- scale conditions in megacities. She volunteers regularly on medical missions to Guatemala, where she conducted her PhD field research. Dr. Owen is an adjunct professor at George Mason University and at the University of Richmond where she teaches Urban Geography, Human Geography Analysis, and the Geography of Neighborhoods.

Dr. Owen discussed remote sensing in megacities and the potential neighborhood level contributions. Mission planners need to understand sub-areas within a megacity. They need to know what is going on at the neighborhood level, which includes neighborhood names, boundaries, and characteristics.

Remotely sensed imagery data can be used to extract metrics for neighborhoods including information about roads and infrastructure, soils, geomorphology, proximity to hazards, amenities, population density, and built-up areas. Through an understanding of economic-based factors, these metrics may contribute to a better understanding of triggers for conflict, disaffection, instability, and disaster risk.

We are witnessing a new era of volunteered geographic information that can be used to verify, validate, and triangulate geographic content at the neighborhood level from other sources. Two examples of this volunteered geographic information are Open Street Map and Wikimapia. This information can be combined with remotely sensed imagery to create metrics by neighborhood. This is the nexus of the social and the physical. Quality of life, accessibility to amenities, population density, directional growth and densification, economic well-being, and natural hazard risk can now be assessed.

We must continue to fuse remotely sensed data and imagery with volunteered geographic information to quantify intra-urban socioeconomic variation, to scale the results using fuzzy membership functions, and cross validate-volunteered data with authoritative data (government produced names and locations).

Dr. Charles Ehlschlaeger, ERDC

Dr. Ehlschlaeger received his Ph.D. from the University of California at Santa Barbara in 1998. After 14 years in academia performing theoretical and applied research in technical geography, he returned to the Army Corp of Engineers Research and Development Center (ERDC) in Champaign, IL to do applied human geography research in demographic modeling, visualization, and social cultural simulation models. Dr. Ehlschlaeger is currently the technical

lead on SMA/ERDC's Megacities-RSI project exploring ways to improve strategic operational planning with higher quality social science data. He infrequently teaches a class at the University of Illinois in Urbana.

Dr. Ehlschlaeger discussed phase 0 megacity geotemporal informatics for stability operations. There are large amounts of data from a vast number of sources in phase 0 environments. Since our research in Bangladesh is currently in a phase 0 environment, we need to be sure that we are harvesting the appropriate information with respect to phase 0 but also for the other phases in preparation for the future.

Phase 0 strategic and tactical monitoring and reconnaissance in reconnaissance, surveillance, intelligence (RSI) is able to provide information for planning, situational awareness through detailed maps, and assessments of operation to planners and operators. RSI can also provide multi-thematic long data at the neighborhood level. We are analyzing three examples of this type of data: the International Public Use Microdata (IPUMS), Vulnerable Population Survey (VPS), and Demographic and Health Surveys (DHS). This long data can then be used to create long data media analyses, which move the data from being static to dynamic. We are also analyzing the GDELT Global Knowledge Graph,[5] which creates daily media analyses with 152 themes connecting people, organization, and other media events to place, time, and tone. The types of data and information that is collected through RSI will benefit planners in more effectively forecasting into the future. The main goal of this research is to create maps of indicators supporting USPACOM's Socio-Cultural Analysis Framework with data accurate enough to begin validating social science theories for operational use.

SMA's Megacities- RSI effort is currently putting together a while volume titled "Understanding Megacities in the RSI Paradigm."

Mr. Gerald Scott, NPS

Mr. Gerald ("Scotty") Scott is a Research Fellow and PhD student in the Information Sciences Department at the Naval Postgraduate School (NPS) in Monterey California. At NPS he manages the OSD-Sponsored Joint/Interagency Field Experimentation Program and conducts inter-disciplinary research in Information and Influence Operations, multi-level security computer systems, and decision-making in complex environments. Scotty is a retired Army Lieutenant Colonel. While on active duty he served as an Air Defense Officer in Europe and the Middle East and as an Information Operations Officer in the Middle East and the Pentagon. Scotty received and MS degree from NPS in 2003 in National Security Affairs, with and emphasis in Information Operations and Interagency Cooperation.

Mr. Scott discussed understanding, visualizing, and communicating megacities within DoD. A significant challenge about understanding megacities is the sheer amount of data that is

[5] http://gdelt.utdallas.edu

involved in the process of understanding. A method for making sense of all of this data and visualizing it clearly needs to be created.

Semi-automated and automated processing of this type of megacity information typically remains in the analytic community. It does not sit on the desk of the planner that needs to make the decision. Tools need to be created for understanding megacities that are easily accessible to planners. These tools should allow the planners to interact with SMEs using real shared data—not transactional data. A system needs to be developed where the analysts and modelers can interact on one view of the planning tool to refine the models and analyze the data but at the same time the planners can be using the tool from another view to generate their plans. There is a sense among the planning community that this should be possible.

NPS would like to take the models that are being developed and used to analyze megacities and put them into a platform, which NPS already has government funding for, for use. From there, two views can be created: a planner focused view and an analyst focused view. This distinction would help to understand the differences between the analyst and planner viewpoints.

NPS has a Field Experiment Program that will try to develop this tool. NPS encourages participation in this effort in providing direction for where the tool should be used within the community. It is crucial that we improve the tools that are being provided to planners.

Discussion

Mayors are local leaders in cities that have to deliver actual results to their citizens and cities. Does the DoD look at the mayors of these megacities?

Dr. Batson noted that there is an interesting book titled "If Mayors Ruled the World." Megacity mayors operate both at the local level and internationally. They have to provide services to their constituencies in order to stay in power. For example, the last two mayors of Lagos, Nigeria have been exemplary in providing services to their people. This underscores the significance of megacities and why they need to be studied. Mayors are in touch with their constituencies and can typically get things done faster in a city than the regional governments.

Have you looked at what causes these cities to grow? Will these megacities be growing forever or will they eventually reach a maturity level?

Dr. Owen noted that megacities are not a new trend. People generally move to megacities for economic gain. They generally move to areas where the residents share similar ethnicities. Megacities with declining population growth are typically in the first world or developing areas. What is important to look at with respect to megacity growth is the directionality of the growth and growth densities, which can then be related to actual population growth to determine if the infrastructure in the city can handle the growth.

Dr. Batson added that urban poverty is shocking because it is so dense. No one wants to live in a slum, yet 180,000 people migrate from rural to urban areas every day. Most of these people know that they will end up in a slum, but there is a chance, slim as it may be, that they will improve their livelihood.

Mr. Browne added that this is precisely the type of question that we want help framing from a USPACOM perspective. The key issue is the adaptability of a megacity to respond to a crisis. This is what USPACOM is trying to build a framework for.

What are your thoughts on integrating remote sensing with human geography, open source, and social media data and information that go beyond remote sensing imagery?

Dr. Owen noted that remote sensing needs to be sourced with these types of information. The goal is to fuse this kind of information with remotely sensed data.

From a USPACOM perspective, what are the dimensions or characteristics of a baseline definition for stability in a megacity?

Mr. Browne noted that this is the question that USPACOM has been trying to answer. USPACOM is interested in using NSI's Stability Model (StaM) to understand stability and how stability works.

Dr. Astorino-Courtois added that on one hand there are different types of models for understanding stability but on the other hand there is the real-life situation facing planners at the COCOMs. Any conceptualization is going to start with the question, what do you want to know? We have the stability model, but the definitions within this model are not the key questions for the COCOMs. The COCOMs are trying to understand when they need to react to something that is happening. NSI is working with USPACOM to fuse those stability factors from the StaM with the very specific mission centric issues that planners deal with. We are trying to create a framework for dealing with stability threats.

Panel Eight: South Asia and the Pacific Region: Opportunities and What Can Derail Them (Moderator: Dr. Tom Lynch, NDU-INSS)

This panel explored long-term and short-term regional and sub-regional stability in South Asia and the Western Pacific region. It assessed the trajectory of increasingly global national interests in the region—especially those of China and India. It compared these with key U.S. interests abroad by issue and location in order to identify a) those areas where U.S. and regional interests are likely to conflict and b) those regions or issues about which the U.S. and Regional Powers share complimentary interest.

Panelists:

- Mr. James Clad, Senior Advisor, Asian Affairs, Center for Naval Analysis (CNA) and Former Deputy Assistant Secretary of Defense for Asian and Pacific Security Affairs

- Dr. Frederic Grare, Director and Senior Associate, South Asia Program, Carnegie Endowment for International Peace (CEIP)

Dr. Tom Lynch, NDU-INSS, moderated the panel. *Dr. Lynch is a distinguished Research Fellow who researches, writes, lectures and organizes workshops and conferences for Department of Defense customers on the topics of Pakistan, Afghanistan, India & the Subcontinent, the Gulf Arab States, and the past & future trajectory of radical Islam. Dr. Lynch has published widely on the politics and security of South Asia and the Near East, including articles in Orbis, The American Interest, and Joint Forces Quarterly; book chapters in publications by NDU Press, Oxford University Press and Johns Hopkins University Press; and feature monographs with the New America Foundation, the Combating Terrorism Center at West Point, and NDU Press.*

Dr. Lynch stated that through his work at NDU, he has studied stability factors in Pakistan including frames of references in South Asia, particularly the dynamic between Pakistan and India. Additionally, he has applied these frames of reference to the two most dynamic actors in South Asia: India and China to identify opportunities and barriers to stability. He raised the concern that the artificial barrier between PACOM and CENTCOM and India and Pakistan makes it difficult for analysts and planners to address transboundary concerns.

Dr. Frederic Grare, Carnegie Endowment for International Peace

Director and Senior Associate, South Asia Program, Carnegie Endowment for International Peace, Washington, D.C. Frederic Grare is senior associate and director of Carnegie's South Asia Program. His research focuses on South Asian security issues and the search for a security architecture. He also works on India's "Look East" policy, Afghanistan and Pakistan's regional policies, and the tension between stability and democratization, including civil-military relations, in Pakistan. Prior to joining Carnegie, Grare served as head of the Asia bureau at the Directorate for Strategic Affairs in the French Ministry of Defense. He also served at the French embassy in Pakistan and, from 1999 to 2003, as director of the Centre for Social Sciences and Humanities in New Delhi. Grare has written extensively on security issues, Islamist movements, and sectarian conflict in Pakistan and Afghanistan.

Dr. Grare addressed the interests of India and China in South Asia. He expressed some misgivings with the topic he was asked to address: "geostrategic interests and risks as for India and China as each views Southeast Asia and the Western Pacific." First, the title implies that the regional dynamic is a zero sum game, which does not exist. The strategy of both India and China vis-à-vis each other is a mix of integration, balancing, and containment. Second, it dramatizes the relationship too much. There will not be any major shifts in the next few years.

What is interesting is strategy. China's objective is known, and we have known it forever. The government wants to expand trade routes, gain access to food and energy sources, and exert influence in the region to stop encirclement. However, since 2010, the tactics and strategies employed by China are new. No matter how you perceive change, there has been change, which has produced fear and mistrust.

Meanwhile, India perceives China as its main security challenge. For the past two decades the so-called "Look East policy" has been India's instrument to try to mitigate the threat. The Look East policy initially aimed at developing trade with, and attracting foreign direct investment from, ASEAN countries to finance its economic reforms, but the policy soon broadened both substantively and geographically to include more political and strategic concerns. China had always been a critical determinant of India's policy in the region and New Delhi has always seen Southeast Asia as a key defensive space. Moreover, control over the sea lanes through the Indian Ocean provided India with considerable strategic leverage. However, with China's rise came the need for India to expand its strategic role in Southeast Asia to balance Beijing's influence in the area. This led to the search of new partnership. India developed defense agreements with several countries in the region. India has, moreover, an interest in carving a place for itself in preventing any emerging regional order from being dominated by China, hence its participation in the various regional fora (ASEAN summits, ARF, EAS).

What does this mean from India's partner countries? India still has a long way to go to institutionalize partnerships with countries in Southeast Asia. It has difficulty in identifying common interests. Even where there is a common interest, there are differences in regional security expectations. Collaborating with India means being potentially perceived as ganging up against China without any additional security benefits. India will likely continue to develop these partnerships, but it will not be influential until it fortifies its own military capabilities and proves more assertive politically.

Furthermore, India does not want to be seen as a counterbalance to China. New Delhi is cautious about any action that could be perceived as containment. Countries in Asia are concerned about what the future presence of the USG in the region will be given budgetary constraints as well as, more importantly, given the development of China's capability, which will make any potential intervention more costly. China has become increasingly assertive in the South China Sea. A confrontational relationship between China and the USG is one of India's fears but so is a too cozy relationship between Beijing and Washington. Countries in Asia will still look to the U.S. for security, but they will also begin diversifying. However, India does not want to be the counterbalance to China.

The problem is a question of capability. For countries to partner with India, they would expect benefits. They want India to help prevent a region dominated by China.

Dr. Lynch thanked Dr. Grare. He stated that Dr. Grare offered a sober counterbalance to what you see in articles by Indian enthusiasts who highlight India's economic growth and increasing trade ties between India and China. There is dynamism in the India/China relationship, but there are also limitations. We need to keep those in mind.

Mr. James Clad, Center for Naval Analysis

Dr. James Clad is a senior adviser at the Center for Naval Analyses (CNA) in Arlington, Virginia. He is also an advisor to IHS Jane's and Cambridge Energy Research Associates (CERA). From 2007-2009, Mr. Clad served as U.S. Deputy Assistant Secretary of Defense (DASD) for South and

Southeast Asia. Prior to that he was a senior counselor and director for Middle Eastern affairs at the Overseas Private Investment Corporation (OPIC), and earlier a senior counselor at the Agency for International Development (USAID). From 1995 to 2002, he was a faculty professor of Asian Studies at Georgetown University and Director/Asia-Pacific Energy at CERA.

Mr. Clad spoke about opportunities and challenges from India to Myanmar and onto the Spratly Islands. He also addressed emerging patterns of interaction and contention from South Asia to the West Pacific. Sub-regionally, there are fissures, dangers, and opportunities that directly impact U.S. ability to conduct effective statecraft in Asia. However, the U.S. faces a self-imposed problem in that Asia analysis is stovepiped by region and functional area. One result of this is that the USG likes to think of Asia in blocs, which gives subregional groups like ASEAN more credence than they are worth.

Geography still matters in Asia. In South Asia, countries deal with the question of how to live in India's shadow. Thinking sub-regionally is important because it is the only way to anticipate enduring characteristics and potential behaviors of the players. Water rights will be an issue of major concern in the future. China and India are building dams for hydroelectricity that significantly affect rivers downstream. Furthermore, Westphalian war imposed borders in South Asia cut through ethnicities, feed divides, and continue to create instability.

South Asia is best understood as a frontier region. Many countries live in India's shadow and problems are exacerbated by the Westphalian context. South Asia has always had a fluid and migrating population that does not adhere to national borders. As the USG reduces its footprint in Afghanistan, problems in Kashmir and other subregional conflicts are guaranteed to emerge.

The notion of balance is critical and does not only apply to India. Stability requires subregional balance. Singapore is pleased to host the U.S. Pacific Fleet because its presence makes Singapore feel more secure. The Muslim majority countries of Malaysia and Indonesia have first world cities and a primal fear of their neighbors.

The USG needs to pay attention to the sub-regional characteristics of the region. There is a lot the U.S. could do to partner with countries in east Asia to reinforce their ability to resist Chinese pressure. But this partnership has to be undertaken in a subtle way.

Looking to the future, the USG will face "seam" issues that arise between the PACOM and CENTCOM AORs. The USG needs to remove artificial stovepiping and view the region as a whole.

Dr. Aparna Pande, Hudson Institute

Aparna Pande is a Research Fellow with the Hudson Institute's Center on Islam, Democracy, and the Future of the Muslim World. Aparna wrote her PhD dissertation on Pakistan's foreign policy. Her major field of interest is South Asia with a special focus on India, Pakistan, foreign

policy, security studies, religion in politics and political Islam. Aparna contributes to online newspapers such as The Weekly Standard, Huffington Post, Pajamas Media, IndoLink, Outlook India and Chowk.

Dr. Aparna was unable to attend the conference, but submitted her speech for inclusion in the proceedings.

Introduction

China and India, two of the oldest civilizations, are seen as and viewed by others as rivals. Their rivalry is rooted in a historical context and their colonial experience has shaped their foreign policies. Both countries cherish their civilizational heritage and aspire to a place on the high table. It is interesting that both countries think they have a long-term view and look upon current affairs as their millennial destiny.

Both countries state that they are making an effort but if you scratch the surface you find that both are looking at long-term rivalry and at ways to circumscribe each other's pre-eminence.

Both countries have large populations, need economic growth, and seek access to natural resources like water and energy. The booms in their countries have already moved millions out of poverty and confrontation would plainly jeopardize this movement forward.

In the economic arena, China is one of India's largest trading partners. Their bilateral trade stood at USD $ 270 million in 1990, US$ 2.92 billion in 2000 but US$ 61.74 billion in 2011. However, there is a trade imbalance of around $ 28 billion, which India is worried about. They are also tentatively co-operating in groupings like BRICS and RIC as well as on issues like climate-change policy and world trade.

However, as the world's oil wells run dry, many foresee China-India rivalry redrawn as a cutthroat contest for an increasingly scarce resource.

Water is already an object of contention, given that several of north India's key rivers, including Indus and Brahmaputra, rise in Tibet. China recently announced that it is building a dam on the Brahmaputra exacerbating an old Indian fear that the Beijing regime means to divert the river's waters to Chinese farmers. Mekong-Ganga Cooperation—a regional grouping in which India and South East Asian countries are members—is seen as a way for India to bandwagon with China's neighbors to push back against Chinese policies.

Whatever cooperation there may be on some issues, the biggest bone of contention and challenge is the legacy of the imperial fault-lines and the border issue.

Border issue & other tensions

The two countries share a 4,000km border that remains largely undefined and bitterly contested. The main problems are in the Ladakh region and India's northeast where each country lays claim to certain territory. China asserts that under the British empire, parts of

Chinese territory or territory of Chinese vassals was made part of the British Indian empire and all that China is now doing is rectifying mistakes of the past.

During the Indian Prime Minister's last trip to China in October 2013 the two PMs signed the Border Defense and cooperation Agreement (BDCA). The aim was to reduce tensions. Earlier in 2013, a standoff had taken place when a Chinese border patrol set up camp several miles across the Line of Actual Control (LAC) in the Ladakh sector of Jammu and Kashmir.

The BDCA Agreement, however, does not bring both sides closer to a final agreement. Since 1981, India and China have held more than two dozen rounds of border talks and since 2005, 16 rounds of talks between Special Representatives. The process has, however, become stuck on the point of finalizing the framework agreement before both sides can move onto the third and hopefully final stage, that of delineating the border on the map and on the ground.

Further, China has never viewed favorably India's providing refuge to Dalai Lama, the Tibetan leader, and thousands of Tibetan refugees. The Tibet issue is tied into this border conflict too because China resents being deprived of Tawang, which is a center of Tibet's Buddhist culture, with one of the biggest Tibetan monasteries outside Lhasa. India's support for Tibet, its granting of refuge to the Dalai Lama and the Tibetan-government-in-exile has always been a sore point with the Chinese.

In recent years, China appears to have reasserted its demand for most of India's far northeastern state. Annoying the Indians further, it started issuing special visas to Indians from Arunachal and Kashmir. It also objected to a $60m loan to India from the Asian Development Bank, on the basis that some of the money was earmarked for irrigation schemes in Arunachal.

China's close ties to Pakistan, which have an economic and military (especially nuclear) dimension, are not viewed favorably by India. Furthermore, deepening Chinese influence within other countries in South Asia—like Nepal, Sri Lanka, Bangladesh—are seen by India as part of China's "string of pearls policy," encircling India by having a presence among its neighbors. The strategic dimension to India's ties with South and South East countries is the desire to not only break free of string of pearls but send a message to China that two can play the same game.

Just as India fears an encircling by China in South Asia, China fears an encircling in South East Asia and East Asia, by U.S. and its allies, including India. China's Sea Lines of Communication (SLOCs) are very long and pass close to countries—whether India or countries of South East Asia, like Indonesia—which will have the ability, if they so desire, to block China's SLOCs.

It is in this context that one needs to view India's look east policy and its attempts in recent years to re-build and strengthen ties with its eastern neighbors like Bangladesh, Myanmar,

and Thailand. There is a growing belief that India needs to deepen ties with its neighbors, make concessions, demonstrate by example in sense that if India grows neighbors would want to be part of this growth and so encourage them to be part of it.

India-Bangladesh

Starting with Bangladesh, Bangladesh is India's largest trading partner in South Asia. As of 2013, India's trade with Bangladesh stood at USD $4.5 bn. In the last few years, India has consistently tried to build better relations with its eastern neighbor from providing economic assistance to boosting trade. India extended a line of credit of US$ 1 billion to Bangladesh for a range of projects, including railway infrastructure, supply of BG locomotives and passenger coaches, procurement of buses, and dredging projects.

The argument made is that Bangladesh is not only a natural pillar to India's Look East Policy by being a bridge to build economic and political linkages with South East Asia but also a friendly Bangladesh is critical for Indian security interests both internal (insurgencies in the northeast) as well as external (China).

In the last few years, the Indian government has encouraged trade between India's northeast and Bangladesh (for example, the setting up of border haats—local markets). India has removed, and is in the process of removing, tariff and non-tariff barriers on Bangladeshi products like textiles and has requested both transit and transshipment trade via Bangladesh both to India's northeast but also to Myanmar and beyond.

There is also an internal dimension to India's growing economic ties with its neighbors. There is an argument to be made that boosting trade between India's northeast region and India's neighbors will not only boost the domestic economy of India's northeast but also have strategic and diplomatic benefits (for example, preventing insurgents from using the territory of India's neighbors.)

There is a strong view that these economic ties should be extended from Bangladesh to include Myanmar, Thailand, and other South East Asian countries. In order for this to take place, India needs to invest in infrastructure in the northeast and tie it up with India's neighbors. This would require ensuring that the Golden Quadrilateral infrastructure project started in early 2000s continued and especially the East-West Corridor National Highway and that this would tie up with the Asian highways, which would connect to Bangladesh, Myanmar, and Thailand. Another long-term infrastructure project is the projected rail link between New Delhi and Hanoi (Vietnam) under the Greater Mekong Sub Region Cooperation agreement.

India-Myanmar

As with Bangladesh, India is looking to Myanmar for strategic and economic reasons. Myanmar is seen as the link to South East Asia, the only South East Asian country with which India has a land border. It goes without saying that for India Myanmar is critical not because it has natural resources but also India is suspicious of Chinese influence and

intentions. Further, as with Bangladesh economic ties with Myanmar will help boost India's northeast economy and boost regional economic integration between India and its neighbors.

India-Myanmar bilateral trade has expanded significantly from US$ 12.4 million in 1980-81 to USD $ 328 mn in 1997-98 to US$ 1.4 bn in 2010. India is the fourth largest trading partner of Myanmar after Thailand, Singapore and China.

India is involved in a number of infrastructure projects in Myanmar especially road, rail, and energy projects. For example the Kaladan multimodal transport project would extend by sea from the city of Kolkata in India to the coastal town of Sittwe in Myanmar, proceeding further by river and land back up into India's northeast. The Asian Highway is being upgraded all the way from Manipur through Myanmar to the Thai town of Mae Sot by 2016.

India-Thailand

Turning to Thailand, India shares a maritime boundary in the Andaman Sea with Thailand. The India-Thailand relationship has a strong growing regional dimension in addition to the bilateral aspect. India's 'Look East' Policy and Thailand's 'Look West' Policy complement each other in strengthening this regional partnership.

Their total bilateral trade stood at $4.6 bn in 2008 and $9.9 bn in 2012. The two countries agreed to sign an FTA in 2003 but are still working out the detailed protocols.

Like Myanmar and Bangladesh, Thailand too is a country where India has infrastructure projects helping build a bilateral as well as multi-lateral relationship. For India, the critical infrastructure project is the multi-billion dollar 1,632km India-Myanmar-Thailand trilateral highway that is being built under the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) framework.

The regional cooperation framework of India-Thailand relations is reflected in the fact that both countries are part of a range of regional cooperation groupings such as ASEAN, East Asia Summit (EAS), Bay of Bengal Multi-sectoral Technical and Economic Cooperation (BIMSTEC), Mekong-Ganga-Cooperation (MGC), and Asia Cooperation Dialogue (ACD). Among the newest grouping is the BCIM (Bangladesh-China-India-Myanmar) trade corridor, which emerged from the Kunming Initiative.

Conclusion

Dr. Pande discussed the big picture here: India-US ties and how each side views the region. India seeks an inclusive security architecture in the world and in Asia. India would ideally like a multi-polar world and a multi-polar Asia. What India fears is a unipolar Asia with China as the only pole. Both in regional and global terms India and US interests align and will continue to align.

Both countries are concerned about China's rise, both countries are strengthening their ties with China's neighbors; both countries seek to keep open the Sea Lines of Communication. An India that builds closer ties with countries of South and South East Asia helps American interests. However, India's desire for following an independent policy (earlier Non Alignment, now strategic autonomy) will ensure that while the two countries have similar interests and goals they will follow parallel not identical paths.

Discussion

Dr. Lynch concluded that the outcome of competition between the U.S. and China for influence in South Asia is highly complex and depends on regional and sub-regional relationships. Increasing economic interdependence does not necessarily translate into better relations between China and India or the United States. Sub-regional issues will continue to cause tensions including border conflicts (especially Tibet) and freedom of movement in maritime environments (e.g., East China Sea). It is important that the USG understands that even as we develop stronger ties with India, India has many common interests with China as well as long-standing security issues.

USACE is the world's largest water management agency. Mr. Clad mentioned that river basins are important to conflict in Asia. Do you see any opportunities for partnerships as we move away from a more typical security relationship with countries in Asia?

Mr. Clad stated that he did not see many opportunities for partnerships. It is not only the Chinese building dams, but the Laotians and Burmese. There is not enough common ground to create a partnership that the countries in the region could agree on. The USG's role is peripheral. Richard Cronin at the Stimson Center is doing some brilliant work in this area.

Dr. Lynch stated that water is a transregional issue in southeast Asia. Many countries in this part of the world have water management issues having more to do with water damming and flow. Because much of the water is brackish, it poses additional water management issues. It is possible to share best practices with these countries, but the politics involved in the issue is so thorny, that there seems little we can do.

One thing social scientists understand well today is that oftentimes, these international issues have a technical nature and are generally considered not to be politically sensitive. To what extend do theater cooperation plans take into account known methods to mitigate conflict and increase stability through water management training?

Water management issue may seem like a low politics, technical issue, but it dredges up contentious political issues. The USG cannot improve water management outcomes unilaterally; it requires the active participation and consent of the affected countries. Parts of China and southern Tibet are the local watersheds for two major rivers in India.

Going back to the observation presented earlier that the geographical commands do not engage in enough dialogue, Afghanistan is considering putting in 12 dams on the Kabul river, which feeds into Pakistan. How do you see the resolution of this issue?

It is not possible to see a resolution to that problem. It is impossible to separate the technical from the political in this case.

There are fears in Pakistan that after the U.S. drawdown in Afghanistan, Afghanistan could be a new quasi-Kashmir for India and Pakistan. . If Afghan elections are not legitimate and there is no clear power sharing, the likelihood of conflict seems likely to increase.

That fear is not paranoia. If there is not enough residual international presence, Afghanistan will become a seminal proxy playground for India and Pakistan to engage in conflict. There is no escape to this problem.

Panel Nine: The BRAIN Initiative, Neuroscience and Implications for National Security Agenda/Operations (Moderator: Dr. Diane DiEuliis, HHS)

The Decade of the Brain saw tremendous advances in the neurosciences with focused efforts on technological innovations in imaging and genomics. Building on this success, researchers are now poised, through initiatives such as Brain Research through Advancing Innovative Neurotechnologies (BRAIN) and others, to address the gaps in our understanding of the human brain. Links between fundamental neurobiological function and higher order brain processes such as conscious thought and behavior have been discovered, but a comprehensive picture of how brain circuitry functions in real time has yet to be realized. This session explored the upcoming research opportunities and findings that will shed light on the complex links between brain function and behavior, furthering our abilities to create rational capabilities in national security technologies.

Panel Members:

- Dr. Bill Casebeer, DARPA
- Dr. Nicholas Wright, Carnegie Endowment for International Peace
- Dr. James Giordano, Georgetown

Dr. Diane DiEuliis, HHS, moderated the panel. *Dr. Diane DiEuliis, Ph.D. is the Deputy Director for Policy in the Office of the Assistant Secretary for Preparedness and Response (ASPR), U.S. Department of Health and Human Services, a position she has held since August 2011. She is responsible for the coordination of policy and strategic planning for all components of the Office of the ASPR to support domestic and international public health emergency preparedness and response activities. Prior to joining the HHS, Dr. DiEuliis was the Assistant Director for Life Sciences and Behavioral and Social Sciences in the Office of Science and Technology Policy (OSTP) in the Executive Office of the President. During her 4 year tenure at the White House, she was responsible for coordinating health issues among Federal departments and agencies, and was involved in developing policy in areas such as biosecurity, social and behavioral science, human subjects, synthetic biology, federal scientific collections, public access, and biotechnology. She also managed portfolios in the Science of Science Policy*

(devoted to measuring the outcomes of Federal investments in S&T), and Research Business Models (grants and contracts process). Dr. DiEuliis also worked to help coordinate agency response to public health issues such as the H1N1 flu. Prior to working at OSTP, Dr. DiEuliis was a program director at the National Institutes of Health (NIH), where she managed a diverse portfolio of neuroscience research in neurodegenerative diseases such as Alzheimer's and Parkinson's. She completed a fellowship at the University of Pennsylvania in the Center for Neurodegenerative Disease Research. She obtained her PhD degree from the University of Delaware, and completed her postdoctoral research in the NIH Intramural research program, where she focused on cellular and molecular neuroscience.

Dr. DiEuliis introduced the panel, which focused on the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative and neuroscience and its implications for national security operations, and welcomed the panel members.

Dr. Bill Casebeer, DARPA

Dr. Casebeer is a Program Manager in the Defense Sciences Office at the Defense Advanced Research Projects Agency (DARPA). His research interests include neuroethics, the evolution of morality, the intersections of cognitive science and national security policy, philosophy of mind, and military ethics (such as the ethics of torture interrogation). He is the author of "Natural Ethical Facts: Evolution, Connectionism, and Moral Cognition" (MIT Press), co-author of "Warlords Rising: Confronting Violent Non-State Actors" (Lexington Books), and has published on topics ranging from the morality of torture interrogation to the rhetoric of evil in international relations, in venues such as Nature Reviews Neuroscience, Biology and Philosophy, and International Studies. He is a reviewer for multiple academic presses and journals and has conducted numerous refereed conference presentations. Before joining DARPA, Dr. Casebeer was the Deputy Head of the Joint Warfare Analysis Center's Technology Advancement Department. A retired Air Force Lieutenant Colonel, his most recent intelligence assignment was as the Chief of Eurasian Intelligence Analysis, NATO Military Headquarters.

Dr. Casebeer spoke about the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative. The BRAIN initiative is a bold new research effort to revolutionize our understanding of the human mind and uncover new ways to treat, prevent, and cure brain disorders. It was started roughly eight months ago by the President and has almost $100 million in funding distributed between the National Institutes of Health (NIH), National Science Foundation (NSF), and DARPA. The initiative will focus on foundational science, applied science, and advanced sensor technology and application. DARPA's contribution to the initiative will be to help in understanding the dynamic functions of the brain and demonstrating breakthrough applications based on these insights. The purpose behind the initiative is to allow us to better sense and model for the prediction of behavior. The initiative will do three things:

1. develop technology that will allow us to better sense and monitor the brain;
2. make progress against clinical problems like Alzheimer's, PTSD, Dementia, etc.; and

3. use the knowledge gleaned to develop new tools, training opportunities, and other resources.

The study of the brain is important because it is the wellspring of human behavior. In the national security domain, especially, there should be an interest in understanding the brain. Understanding the brain is critical because it is part of the ecology that drives human behavior that is important to national security.

DARPA has numerous programs that focus on understanding the brain. These programs range in focus from the clinical domain to examining narrative networks. Some of DARPA's newer brain initiatives include Restoring Access to Memory (RAM); Systems-Based Neurotechnology for Emerging Therapies (SUBNETS); and Functional Architecture of the Brain, Restoring Impairments and Improving Cognition (FABRIC).

- RAM is working to develop new methods for analysis and decoding of neural signals in order to understand how neural stimulation could be applied to facilitate recovery of memory encoding following brain injury. Ultimately, RAM is aiming to develop a prototype implantable neural device that enables recovery of memory in a human clinical population. Additionally, the program encompasses the development of quantitative models of complex, hierarchical memories and exploration of neurobiological and behavioral distinctions between memory function using the implantable device versus natural learning and training.
- SUBNETS is pursuing advances in neuroscience and neurotechnology that could lead to new clinical understanding of how neuropsychological illnesses manifest in the brain and to advanced therapies to reduce the burden and severity of illness in afflicted troops and veterans. SUBNETS is working to develop a new investigative approach that establishes the characteristics of distributed neural systems and attempts to develop and apply therapies that incorporate near real-time recording, analysis, and stimulation in next-generation devices inspired by current Deep Brain Stimulation (DBS).
- FABRIC is a new program idea designed to provide novel approaches to promoting scientific collaboration to accelerate discovery in brain science. FABRIC will work to develop new approaches to functional analysis of brain networks for understanding human cognitive decision-making, dynamics of plasticity and learning, and precise, quantitative characterizations of PTSD/TBI using an integrated dynamic network of genetic, proteomic, imaging, physiologic, structural, clinical, and functional outcome data.

There are three main growth areas that need to be developed with respect to understanding the brain. First, we need to better understand when and how the brain recognizes problems. Second, brains influence culture and this is critically important to study. Third, we need a better understanding of how brains function in groups and how things like socialization and identities link to the brain.

Dr. Nicholas Wright, Carnegie Endowment for International Peace

Dr, Nicholas Wright is an Associate in the Nuclear Policy Program at the Carnegie Endowment, where he works on neuroscientific perspectives on nuclear decision-making. His work

combines experience from two fields. In the policy sphere, Wright was a Visiting Fellow in the Department of Government at the London School of Economics, and also organized high-level public policy workshops and events in the UK. In addition, Wright is trained in neuroscience and biology. He worked clinically as a neurologist in Oxford and at the National Hospital for Neurology in London, and subsequently spent five years using technologies like functional brain imaging to examine economic and political phenomena, conducted as a Fellow at the Wellcome Trust Centre for Neuroimaging at University College London (UCL). He received a medical degree from UCL, a BSc in Health Policy from Imperial College London, has Membership of the Royal College of Physicians (UK), and has an MSc in Neuroscience and a PhD in Neuroscience both from UCL.

To conduct deterrence operations, or to manage crises and escalation, it is necessary to predict how an adversary will decide to respond to our actions. Effective deterrence and escalation management thus crucially depends on an understanding of psychology.

This talk described three insights from neuroscience, which help us to predict how an adversary will decide to respond to our actions, and then four simple rules for using neuroscience to address such issues.

The first insight is that an action's impact on one's decision-making is crucially modulated by a specific quantity associated with that action: this quantity is the difference between what happened and what was expected. This quantity is known as the "prediction error" associated with an action. It has been a core finding in neuroscience over the past 15 years that "prediction errors" are central to the mechanisms by which humans and other animals understand, learn, and make decisions about the world. The prediction error associated with an event modulates the impact that the event has on decision-making; the bigger the prediction error, the bigger the impact on subsequent decision-making.

This provides a simple framework that explains a wide variety of historical cases. Consider the case where an event occurred and was not expected, so is associated with a large prediction error. German air raids on London in the First World War using zeppelins were small-scale, but as they were so unexpected, they had a large impact and caused panic. There were demands for factories to be closed down if they risked further raids and members of the public assaulted officers of the Royal Flying Corps in the street for allowing these terrifying zeppelins through. Extrapolating from this, highly influential airpower theorists in the inter-war period suggested more powerful and recurrent bombing would, largely through psychological impact, have a paralyzing effect and rapidly make them collapse. So what actually happened? In the Second World War, recurrent bombing clearly exerted much greater destructive power—for example, during the "Blitz" on London—but given its expected nature, it exerted much more limited psychological impact than had been anticipated.

This prediction error framework also simplifies across a wide variety of important strategic phenomena. For example, the psychological impact of surprise is just one instance of prediction error, where something happens, and it is not well expected.

This framework can be used in a China-US contingency—for example, over Taiwan—to calibrate the impact one's actions will have on the adversary. It predicts domain specific effects, where actions in less well understood domains (e.g., cyber or space) will have an inherently larger psychological impact. It predicts cross-domain responses will also have a larger psychological impact than anticipated, as responses are more likely expected in the same domain as the original action.

The take-home message here is to understand prediction errors and use them as a tool to implement and interpret signals. This speaks directly to the challenge General Fay raised today at the end of his talk here: to better understand communication.

The second insight is that decisions are the product of multiple, describable decision systems in the brain. The idea that multiple decision systems contribute to choice is not new: Plato, Freud, and more recently Danial Kahneman suggested it. The point is that now we are able to specify how these systems work. We think there are essentially three decision systems—none of them are rational in the economic sense and only one decides based on the potential consequences of actions. The point, however, is that these systems are well described, not just an endless variety of heuristics and biases. Again, this insight explains a variety of historical cases, and makes specific predictions about an adversary's behavior.

The third insight is that the “social brain” can exert powerful influences on decision-making. An important example is social motivations, such as the motivation to reject unfair treatment. In a classic example known as the ultimatum game, one individual gets an amount (e.g., $10) and proposes a split (e.g., $9 for her, $1 for the other). The other individual then decides to either accept the offer, in which case both get the split as proposed or reject the offer in which case both get nothing. Humans tend to reject low, unfair offers and pay to do so. Individuals pay to punish fairness even when the stakes are many months’ salary.

An earlier panel discussed the importance of inequality, and this explains why inequality matters. Historically, in China, the "unequal treaties" during the "century of humiliation" play a powerful role in current narratives and motivations, and we see a similar influence in Iran. Now, in planning, when trying to predict an adversary's motivations and decision-making, we can ask a specific question: will this be seen as fair to leaders, key interest groups or the public?

And so I have given you a flavor of three insights from neuroscience, which helps us to predict how an adversary will decide to respond to our actions.

Next, he described four general rules for using neuroscience to address such issues.

First, are we sure enough of the neuroscience? There is a plethora of ideas and findings in a field like neuroscience. Here, I used only core findings from the neuroscience of decision-making.

Second, does it matter in the real world? Such findings may be very convincing in individuals making particular decisions, for example in a lab – but in the real world, with all its complexities and existing structures, and unintended or unpredictable consequences, we may not see such an effect. Here I have provided a wide variety of historical cases across many different contexts.

Third, even if it is true in the real world, is it worth adding to the policy process? Given all the many important considerations when developing or using policy, adding yet another consideration can carry a big opportunity cost. Here, for example, the idea of prediction errors replaces and simplifies across a wide range of important phenomena.

Finally, what does the neuroscience add that psychology does not already give us? There is the general concept of "consilience"—an idea may be more robust if it is supported by both psychology and neuroscience, and neuroscience can help choose between otherwise similarly plausible behavioral explanations. There are also specific arguments, for example, about the importance of universalism. If we know prediction errors play an important role in decision-making across a wide variety of different species, including in humans, then it is much more likely that they play an important role in, for example, both the U.S. and China. This is important when thinking about generalizability within countries or cultures—for example, where key policy-makers have usually undergone an involved selection process—and so may differ from the general population.

This gives a flavor of how insights from neuroscience help understand an adversary's decision-making - and do so in a way that can be usefully, simply operationalized.

Prof. James Giordano, Georgetown University

Prof. James Giordano, PhD, is Chief of the Neuroethics Studies Program in the Edmund D. Pellegrino Center for Clinical Bioethics and on the core faculties of the Division of Integrative Physiology in the Department of Biochemistry, Inter-disciplinary Program in Neurosciences, and Graduate Liberal Studies Program at Georgetown University, Washington, DC, USA. He was 2011-2012 Fulbright Professor of Neuroscience, Neurotechnology, and Ethics, and currently is Clark Faculty Fellow and Section Head of the Neurotechnology and Neuroethics Across Generations (NNAG) Program at the Human Science Center of Ludwig-Maximilians Universität, Munich, Germany. As well, Dr. Giordano is William H. and Ruth Crane Schaefer Distinguished Visiting Professor of Neuroethics at Gallaudet University, Washington, DC, and a Senior Fellow of the Potomac Institute for Policy Studies, Arlington, VA. His ongoing research focuses upon the use of advanced neurotechnologies to explore the neuroscience of pain and neuropsychiatric spectrum disorders, neuropathology of neuropsychiatric disorders, and the neuroethical issues arising from applications of neuroscience and neurotechnology in research, medicine, public life, and national security and defense.

Dr. Giordano, discussed a "feet on the ground" view of neuroscience and technology (neuroS/T) to domains of influence arising from recent national programs of federal and private sector support for brain research and its translation. Most notably, in April 2013, President Obama announced the Brain Research through Advancing Innovative

Neurotechnologies (BRAIN) initiative. The goal of the initiative is to revolutionize an understanding of the human brain by accelerating the development and application of innovative neurotechnologies. Approximately $100 million will be invested for scientific research during FY 2014 as first year funding of the BRAIN initiative, with plans for additional federal funding of $100 million for a subsequent three years. The National Science Foundation (NSF), National Institutes of Health (NIH), and Defense Advanced Research Projects Agency (DARPA) will lead federal efforts in the initiative; private support will be provided by the Howard Hughes, and Kavli Foundations, among others, with additional investment coming from the commercial (i.e.- big biotech and venture capital) sector.

NeuroS/T is viable–and of clear value–in spheres of global influence. By definition, influence refers to the capability to affect or control individuals and/or groups through direct or indirect means. NeuroS/T enables unique means and capabilities to access and engage e functions that influence cognitions, emotions, and behaviors. Such insight and access to neural bases of thought and behavior has evident implications–and applications–in healthcare, public life, global relations and national security, intelligence, and defense. The pace and breadth of neuroS/T research and development establishes this field and its outcomes and products as a viable pursuit for leveraging influence–on a variety of levels (from the cognitive-behavioral, through the economic to the socio-political) over the next 10 to 20 years.

Economically, neuro S/T is a $157 billion annual market. Asian research, development, testing, and evaluation (RDTE) in the neuro S/T is predicted to increase by 60 to 68% by 2020. Increased international investments in neuro S/T reflect an escalating trend toward engaging the brain sciences as part of a global network of potential influence. In this regard, three distinct types of influence are evidently operationalizable: market share, socio-economic and political bio-power, and direct military utilization and development and employment of weaponizable neuro S/T.

Such weaponizable neuro S/T need not represent "traditional" constructs of "bombs and bullets," but rather represents the literal definition of a weapon as means of contending against an other. Obviously, this establishes notable dual-use potential for neuro S/T research in agendas of national security, intelligence, and defense. Moreover, given the increasing trajectory of international neuro S/T RDTE, such potential utilization could represent real threat to the United States and its allies, as weaponizable neuro S/T establishes the brain as a potential future battlescape.

Thus, it becomes clear neuro S/T represents a distinct and ever more potent force in international relations and socio-political influence. Despite defined maxims to study and employ brain science(s) toward beneficent agendas, history provides ample reminders that there are a host of nefarious means and goals that would be fortified through the employment of neuro S/T. Identifying the various uses of neuroS/T in these ways is

important to establishing factual bases upon which to develop programs through which to realistically and meaningfully address the ethical, legal, and social issues spawned by neuroS/T RDTE and its applications. Ongoing work by our group–in concert with efforts of others–remains strongly dedicated to these efforts.

Discussion

Much of the neuroscience work seems to be mainly descriptive. Is there work being done to alter behavior at the conscious level?

Dr. Wright noted that it is possible to link the human level to the animal level where a vast amount of manipulations can be run.

What are the questions that we would need to ask from an ethical point of view when neuroscience tools for influence and affect become more readily available?

Dr. Casebeer noted that we do not have to reboot our thinking about the tactics of influence because of neuroscience. Environments, social interactions, etc. are observing influence every single day. It is not that neuroscience uniquely challenges us in the domain of influence; rather it might operate at different special and temporal scales. Influence can be evaluated on three dimensions. First, is the act of influence positive? Second, does the act of influence violate the rights of the person being influenced? Third, is there something bad about me for being the type of person trying to do the influence?

Prof. Giordano added that addressing neuroethical, legal, and social issues NELSI represents a viable step toward ensuring ethical responsibility with respect to neuroS/T RDTE approaches relevant to, and as applied in, programs of influence and deterrence. Prof. Giordano described a multi-step paradigm of neuroethical analyses and articulation developed by his group (called *HISTORY*) that addresses the *Historicity* and *Implications* of related and focal *Science* and *Technology* and, from these perspectives, engage in a process of *Ombudsmanship* (to identify real-world problem scenarios evoked by neuroS/T in particular contexts), *Responsible Yeomanry* to engage ethical precepts to identify extant gaps in information and capability toward addressing/resolving specific problems, and afford guidelines and governance procedures to facilitate sustainability of neuroethical decisions and outcomes .

For this type of work to get started with funding, a human use plan is needed. Have guidelines been laid out for the ethical constraints on human use?

Dr. DiEuliis noted that in terms of public health and therapeutics, there are very strong human use protections.

Dr. Casebeer added that all of the DoD neuroscience work has to meet all of the regulations of human use and then much more.

Summary and Closing Remarks, LTC Matthew Yandura, JS/J-38/MISO

LTC Yandura thanked the panelists, moderators, and conference attendees for another successful SMA annual conference. He encouraged participants to build on relationships formed during this conference. There has to be value in relationships or conferences like this go away. The military community should remember that they are not just recipients of this scholarship and research, they are part of the social science community, who are acting in service of this nation.

Appendix A: Agenda

Day One Wednesday, 13 November 2013	
0730 - 0800	**Registration**
0800 - 0805	**Administrative Remarks:** Ms. Margaret Egan (SRC)
0805 - 0810	**Introduction:** LTC Matthew Yandura (JS/J-38/MISO)
0810 - 0815	**SMA Overview:** Dr. Hriar Cabayan (JS/J-38/SMA)
0815 - 0855	**Guest Speakers:** Brig Gen David Been (JS/J-38), Mr. Earl Wyatt (OSD, ASD (R&E)/RFD); Mr. Ben Riley (OSD, ASD, (R&E)/RFD)
0855 - 0930	**Key Note Speaker:** LTG Michael Flynn (Director, Defense Intelligence Agency)
0930 - 1000	**Break**
PANEL DISCUSSIONS	
1000 - 1100	**Panel One** **Improving Global Prospects for Peace: Perspectives on the US Religious Engagement** Moderator: LTC Matthew Yandura (Joint Staff, J38, MISO)
1100 - 1230	**Lunch**
1230 - 1330	**Panel Two** **Mega-Trends and Implications for DOD** Moderator: Mr. Dan Flynn (DNI/NIC)
1330 - 1430	**Panel Three** **What is so special about the Current Era and "Why"?** Moderator: Mr. Ben Riley (OSD, ASD, (R&E)/RFD)
1430 - 1500	**Break**
1500 - 1600	**Panel Four** **The Role of Social Sciences in National Security and Validation and Validity Concepts** Moderator: Ms. Laurie Fenstermacher (AFRL)
1600	**Day 1 Wrap Up**

Day Two Thursday, 14 November 2013	
0730 - 0800	**Registration**
0800 - 0805	**Remarks**
COMMAND DISCUSSIONS	
0805 - 0905	**Feedback from Commands:** What are the pressing needs in your Commands? Moderator: COL Chuck Eassa (Joint Staff, J38)
PANEL DISCUSSIONS	
0905 - 1005	**Panel Five** **Transnational Criminal Organizations (TCOs): A Global Perspective** Moderator: Mr. Chris Ploszaj
1005 - 1025	**Break**
1025 - 1055	**Invited Speaker:** Brig Gen Timothy Fay (Joint Staff, J33)
1055 - 1155	**Panel Six** **A Sociotechnical World: A New Era of Disruption and Opportunities for Innovation** Moderators: Dr. Val Sitterle (GTRI) and Maj David Blair (Georgetown)
1155 - 1255	**Lunch. Brown Bag Lunch with LtGen Robert Schmidle, National Security and Universal Moral Principals**
1255 - 1355	**Panel Seven** **Megacities in the 21st Century: Opportunities and Challenges** Moderator: Mr. Dave Browne (PACOM)
1355 - 1455	**Panel Eight** **South Asia and the Pacific Region: Opportunities and what can Derail them** Moderator: Dr Tom Lynch (NDU-INSS)
1455 - 1515	**Break**
1515 - 1615	**Panel Nine** **The BRAIN Incentive, Neuroscience and Implications for National Security Agenda/Operations** Moderator: Dr. Diane DiEuliis (HHS)
1615	**Conference Summary & Closing Remarks, LTC Matt Yandura (JS/J-38/MISO)**