

Security Workshop 2008

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Washington, D.C., USA*

Globalization & Maritime Security Conference Report



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Temasek Defence Systems Institute (TDSI) was established in July 2001 as a collaboration between Naval Postgraduate School, Monterey and the National University of Singapore (NUS). Its mission is to conduct high quality postgraduate education and research in defence technology and systems for Singaporean and international students.

At the initiative of the TDSI Management Board, the 1st security workshop was held in November 2004 at NPS, Monterey where 16 researchers from Singapore met their NPS counterparts. The goal was to enable faculties from NUS and NPS to meet and share their research experiences with a view of enhancing mutual trust and establishing networks for joint collaboration in research and teaching. The 24 presentations and social interactions that November achieved this goal. The 2nd Workshop was held in December 2005 in Hawaii where 41 participants from 10 organisations, including Lawrence Livermore National Laboratory, met. The venue for the 3rd Workshop moved to Singapore in December 2006. Its theme "Maritime Security: from harbours through straits and open seas" attracted 74 participants from 15 organisations, including the USN Pacific Command and Royal Swedish Navy. Its resounding success concluded that the next meeting be held earlier—in summer 2007—at NPS. The 4th Workshop at NPS in June 2007 saw 28 presentations on Maritime Security, Modelling and Technology and group brainstorming sessions which identified 3 research areas. Several months later, 143 participants from Australia, USA and Singapore met at Singapore in December 2007 for the 5th Maritime Security Workshop. They consolidated the research areas requiring sponsorship at the close of that meeting. We now present the report for the 6th Security Workshop held in Washington DC, USA 29–31 July 2008.

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Workshop Theme and Objectives

Workshop Theme: Globalization and Maritime Security

Globalization, despite its many positive attributes, also brings complex security challenges. Climate change, pandemics, energy and food scarcity, and trans-national terrorism compel us to think about security in a new way, to develop better understanding of global systems, and to forge stronger collaborative efforts for conflict prevention and stabilization. The safety of ports and strategic waterways are affected by globalization. The majority of the world's population lives within a few hundred miles of oceans, and the preponderance of global trade travels by sea. Globalization effects are key influences in A Cooperative Strategy for 21st Century Seapower, the 2007 strategy published by the US Navy, Coast Guard and Marine Corps. The document emphasizes long-term relationships and raises the consideration of the prevention of war on a level equal to consideration of the conduct of war: "We believe that preventing wars is as important as winning wars."

Workshop Summary

From 29 – 31 July 2008, the Sixth US–Singapore (NPS) (NUS/TDSI) Maritime Security Workshop was held at the Marriott Crystal City Gateway Hotel in Arlington, Virginia. Nearly 100 participants attended this event from both the US and Singapore, as well as other countries, which was co-sponsored by the Naval Postgraduate School (NPS) in Monterey and the National University and Temasek Defense Systems Institute (NUS/TDSI) of Singapore. Further support was provided by the US Naval War College, Monterey Program, the Lawrence Livermore National Laboratories (LLNL), and the US Army Peacekeeping and Stability Operations Institute (PKSOI) from Carlisle, PA.

The three-day workshop provided attendees with the opportunity not only to present their own research interests, but also to actively discuss mutual collaboration efforts to expand the relationship between the social and hard sciences in security and stabilization research. This year's security workshop theme, Globalization and Maritime Security, represented an expansion of emphasis from previous years, which had been almost exclusively on more narrow, technical areas—primarily focused on threats to the Straits of Malacca and the Port of Singapore. While those two topics remained areas of important concern within the maritime security track, a much broader range of topics was addressed at this year's workshop.

For the US the Vice Chief of Naval Operations, Admiral Patrick Walsh, USN, (PhD) delivered the keynote speech on Day One of the workshop. His presentation addressed the dynamic nature of the challenges that confront the US, Singapore and their friends and allies in achieving Global Maritime Partnership in the early part of the 21st century, which the new US Navy Maritime Strategy promotes as needed to succeed in this era of increasing economic and social globalization. Brigadier General TAN Yi San, the Future Systems Architect of Singapore surveyed key trends, including the growing maritime security role of Asia, some underlying

structural factors, and discussed the need for leadership in dealing with some major shocks such as oil and alternative energy sources, terrorism and climate change.

Structurally speaking, the workshop continued with a series of morning and noontime plenary sessions. DASD Greg Gross highlighted maritime security challenges among the complexities of globalization and the role that Sections 1206 and 1207 rules play in the new Defense Authorization Act to increase interagency cooperation and build multilateral, flexible partner capacity, in particular to deal with maritime piracy.

Day Two panelist Cynthia Irmer, State Department Coordinator for Reconstruction and Stabilization, focused on how preventing wars is as important as winning them because conflict fuels escalation. Major General Herbert “Buz” Altschuler, USA drew upon experience in Bosnia to explain his new six-phase model to plan and conduct conflict prevention operations and how that approach fits into his expectations regarding the challenges of his upcoming job for the new Africa Command. Rounding out that panel, RADML Lee Metcalf, USNR related his experience and efforts as Director of the Global Maritime Situational Awareness (GMSA) office, which employs a very broad interagency approach to achieve a more improved assessment of the Global Maritime Picture and allow for expanded information sharing among partners.

DASD (Homeland Defense) Don Loren addressed the need for better integration between technology and policy solutions in support of civil authorities, especially at the state and local governance levels, as DoD and its partner organizations prepare to deal with incipient short-fused problems.

Former Senator Gary Hart spoke on Day Three at the final Plenary Session. He addressed the myriad non-military challenges facing the US and the world under globalization, as well as the important need to develop and encourage new creative thinking leaders in the mold of such men as George Marshall and Dean Acheson.

Afternoon sessions took two parallel tracks to address wider issues affecting Maritime Security (Track One) and a Globalization Systems approach (Track Two) which covered even broader topics, but with an attempt to tie those in with their likely or potential impact on Maritime Security. These diverse topics included:

- Maritime Security in a new context—globalization and the role of non-state actors
- Globalization’s effect on Governance—relationships (trust, risk, perceptions, power)
- Prevention—incentives, resource coordination, social-cultural factors, indicators
- Methods—tools, information-sharing, attitudes, modeling and simulations
- “Avoiding the unmanageable while managing the avoidable”

Given this intense and stimulating mix of viewpoints and ideas, workshop participants then shifted their efforts from simple “information sharing” toward finding ways to pursue mutual collaboration in related research areas. This allowed attendees to join in a group participation exercise designed to help define and refine research proposals among cross-cutting organizations, which in turn might bring a new perspective on many of the globalization and maritime security challenges which were raised during the workshop. The appendix to this report captures the putative research program profiles and poses the key research questions which may suggest the way ahead for future efforts in this field.

Goals and Objectives for the Security Workshop

- Provide a forum to bring researchers and sponsors together to share research and education interests related to maritime security & globalization effects.
- Better comprehend the systems in which crises emerge, in order to shift awareness from a response mode to a more proactive, predictive mode.
- Identify leadership competencies required to facilitate these shifts and manage change in complex environments.
- Establish support, sponsorship, and follow-on activities for research ideas generated.
- Generate ideas, proposals, and action items for future research that will move the body of work and knowledge forward.

The workshop convened as a plenary group each morning, and divided into two tracks in the afternoons focusing on globalization topics—systems, trends, shocks and prevention, leadership development; and maritime security topics—port security and strait security.

The appendices to the report include research topics and program profiles developed by conference participants. Several themes featured prominently in discussion: systemic approaches to Maritime Security and globalization, specific technological research approaches, the diffusion of control in a globalized environment, and how best to measure and detect the “weak signals” of latent conflict.



Conclusions

1. Globalization and Maritime Security considerations, already highlighted at this 2008 conference, have steadily increasing importance, and will become even more critical to international security and stability.
2. We must take a comprehensive approach towards understanding how to employ all elements of power, political, informational, economic and as the last resort, military power within a global context.
3. Technological advances, if carefully supported and applied, and adequately socialized over time, given differing strategic/cultural views, can provide new tools for solving difficult policy challenges.
4. The Singapore–U.S. collaboration, along with among multiple partners, especially in that volatile region, can provide exceptional insights and opportunities for mutual progress.
5. The distribution of sources and consumption of energy resources, and their transport aspects, especially peaceful (but potentially dual use) nuclear energy aspects, will have a growing impact on military security and global relations among nations. Potential concerns about nuclear proliferation for military uses will remain an area of mutual worry.
6. Cross-disciplinary international graduate education of military officers, and civilians at NPS, the NWC, and other participating universities provides a unique engine for exploring, explaining and understanding change.
7. The political dimension of Globalization shifts and anticipated climate changes will continue to accelerate the forces that drive significant shifts in national and international stability.

Recommendations for Future Work

1. Cross-disciplinary research and development efforts merit shared funding support in order to effectively demonstrate and evaluate candidate solutions in these critical arenas.
2. Port of Singapore and the Straits of Malacca represent key locations where many critical problems related to other globalization and maritime security can occur. Demonstrating shared solutions in these areas is especially important since successes, such as solving the Ship as a Weapon (SAW) problem, might get applied broadly to help protect many U.S. ports.
3. This symposium series should continue at least annually, with at minimum a July 2009 session in Singapore as part of the International Council on Systems Engineering's (INCOSE) 19th International Symposium.
4. Symposium sessions should continue to include a mix of policy priorities, global maritime partnership challenges, and technological opportunities for international maritime security.
5. Cooperative graduate education opportunities deserve even broader support, enabling further directed work to be conducted by government professionals and concerned government and public/private academics in each country.
6. Reporting the results of ongoing research efforts should receive the broadest possible dissemination in order to help inform national leaders and other public decision makers.

Day 1: July 29

*The Navy must
maintain a
permanent
forward
presence and build
partnerships with
other countries.
“Winning” is
being part of
the solution.*



Plenary

Introduction: Dr. Karen Guttieri, Dr. Don Brutzman, Dr. YEO Tat Soon, Dr. Leonard Ferrari, ADM Patrick Walsh, VCNO

Globalization and Maritime Security: US Maritime Strategy focuses on building relationship and preventing wars. What is the future for Maritime Security in the context of globalization? What trends are most significant? What is the new kind of work emerging with political, economic and social developments? What are the critical relationships with partner countries to ensure global and maritime security?

Dr. Karen Guttieri & Dr. Don Brutzman described two related topics behind the workshop conceptual framework: steering technology with policy and the role of new technologies steering policy. The workshop was designed to encourage us to think systemically about this relationship; and to identify necessary leadership competencies to navigate the complex global security environment. Singapore has demonstrated leadership in systems engineering. The National University of Singapore and the Naval Postgraduate School have a long-standing relationship in systems engineering including student exchanges. YEO Tat Soon, of Temasek Defense Systems Institute, University of Singapore provided a program overview and the goal of improving Singapore defense sector technical skills.

Dr. Leonard Ferrari, NPS Provost and Executive Vice President, described the formal 6-year NPS partnership with Singapore which has been centered on the graduate program. Provost Ferrari encouraged workshop participants to consider the impacts of globalization, assess the significant role of international collaboration, and to frame a combined research agenda for globalization and maritime security. There are, as he noted, both positive and negative impacts. Some examples of concerns with surprising impacts include the spread of invasive species from use of ballast tanks, and toxic heavy metals in ships' paint.

President Dan Oliver of NPS provided the formal welcome and introduction of the keynote speaker.

ADM Patrick Walsh, Vice Chief of Naval Operations

We live in a very dynamic security setting. There are 192 countries today versus 46 in 1946. A preponderance of the World's trade goes through the Pacific and Middle East. Two issues, religion and resources, are vital considerations. The United States secular culture has a blind spot for the importance of religion around the world. The demand for resources will produce winners and losers. "The Long War" is waged with a committed enemy. As a result, the Navy must maintain a permanent forward presence and build partnerships with other countries. "Winning" means being part of the solution.

Key Points from ADM Patrick Walsh

- US national security transition—a new security team and strategy, should take 180 days to issue; how to be timely?
- security setting is very dynamic
 - changing roles and states, political interdependence
 - focus on shipping lanes in Pacific and Middle East, supports 90% of world trade
 - involves five international treaties
 - must understand political and social trends
 - Naval command structure is both geographic and functional
 - 192 nations today vs. 46 in 1946
- Middle East area of operations, 27 nations, three continents, 80% of world's energy reserves
 - role of geographic choke points
- Pacific area of operations
- crucial role of religion in globalization
- populations least prepared for change are the most subjected to it
- tightly-coupled nature of events in different regions
- possible to incite a global reaction to local events
- Security ramifications of globalization
 - transnational scope
 - proliferation of WMD
 - in areas where we have little understanding
- Ideology of Takfirism
 - an “unholy war”
 - work for God
 - procurement of WMD is in service of God
- challenges for the Nation-State
 - Winners and losers in demand for resources
- Middle East Challenges
 - explosive population growth
- Western Pacific/Asia
 - pinch in resources
- need speed and agility in global Naval operations
- need a forward presence
- What is the Long War?
 - a global enemy that will fight to the death
 - need to build strength and capacity with partners
 - an endurance race, not a sprint
 - need stability
- must need to know hearts and minds to win
- winning is being part of the solution
- essential to build trust
- US Navy, USMC, USCG, developed a collaborative approach to strategy with Dept. of Interior

Q&A Discussion

To have Navy personnel better address human interests, the Navy will first have to identify priority needs and where it needs to go. One example would be incentives for the Foreign Officer Program. Recently, a passenger vessel was once under attack from pirates 200 miles off the Horn of Africa. The Navy relied on a multi-national coalition which staffs the area HQ. They were able to successfully intercept the pirate ship, capture the pirates, and release the hostages. This required international collaboration, including having a Hindi speaker to communicate with pirates, and understanding the human side of conflict. We don't just live in a kinetic world. More recently we have been able to open doors in Pakistan because of relationships formed in student exchange programs with former Saudi students. All of these initiatives help us have options to “put the guns and missiles aside for a second.”

One way the military can build bridges to business and civil society is through the experiences of responding to natural disasters, for example our response to the earthquake in Afghanistan. This will not be the whole answer, but it helped build coalitions with other countries. So far, these opportunities have been episodic.

As for how the military can work more effectively with NGOs, we don't have all the answers. However, in an African partnership, the use of military vessels for NGOs has been well received.

The Navy fleet is not at a point where we can meet all its needs. The only way to maintain a forward presence is to be direct about putting the value proposition on the table. The Navy will need partnerships with industry for an affordable fleet.

To a degree, all countries want to advance their own agenda through international institutions. We must recognize this in trying to work with them, for example, limitations in the Law of the Sea Convention. There are concerns about the mining issue. Meanwhile, the Chicago convention won't allow fighter escorts in sovereign airspace.

Brigadier General TAN Yih San, Future Systems Architect, Singapore

Summary of General Tan's Comments: General Tan covered three major areas: 1) a survey of key trends, 2) the underlying architecture, and 3) example "shocks". One future trend will be the tilting of the world's population to Asia, especially India. This Asian population will resemble a wire-mesh of interconnected cities, relying more on alternative energy sources, including nuclear. Meanwhile oil production remains outside of most consuming regions. Two major shocks to be prepared for are terrorism at choke points and climate change. The concentration of potential shocks are within "gap" nations. We must therefore build regional security infrastructures to cushion potential shocks.

Key Points from Brigadier General TAN Yih San

- Trends and Shocks
- Shaping Forces: Demography
 - distribution of vigor and youth will tilt towards Asia and Africa
 - Asia will have 400M more people, most growth in India
 - more than a third of megacities will be in Asia
- a wire-mesh of interconnected cities
- uninterrupted flow of information, human and trade movement
- rising prices of commodities
 - growth strong in developing countries, esp. India and China
 - rising oil prices
- shifts to nuclear energy or alternatives—by 2030 Asia will have half nuclear reactors
- global arterial network—for oil transportation
 - Oil transportation
 - Nuclear materials
 - dependencies will increase
- Example Shocks:
 - 1) terrorism at choke points
 - 2) climatic change
- Functioning Core and Non-Integration Gap
 - concentration of potential shocks within the "gap nations"
 - breeding ground for terrorism
 - location of all choke points = Achilles heel
- Climate Change
 - melting ice caps would alter shipping lanes
- Historic Shocks
 - Technology, economic, Great Depression, WW I, WW II, etc.
- Singapore's response—Regional Security Infrastructures to cushion shocks



Q&A Discussion

Where do shocks go from gap countries and how can we to take a hold of them? We don't know what Africa and Asia will do; we can't see beyond 2020. But international collaboration will be crucial, for example, bringing other countries into global trade and education systems. Of course, countries will respond with their own needs in mind. It will take 20-30 years until they can play a role in regions. We hope they will achieve a certain amount of prosperity.

How to identify a strategy to help gap countries move beyond the gap? Many of these countries do have a very glorious recent past. Maybe in the short-run, they will need assistance and greater connections. Singapore cannot do this alone.

The Automatic Identification System (AIS) is for vessels of more than 300 tons equipped with a transponder. Meanwhile we have tracked vessels as small as a jet ski. More collaboration with other countries is planned to share Singapore data. The Navies are working towards opening the program in the middle of next year.

Optimism and hope comes from meeting with colleagues to talk about the future. You can't go too far out. It's not easy to get it right, and it's hard to predict where the human energy is going, for example, in energy production. We can channel energy in positive directions, looking for breakthroughs in alternative energy sources, nuclear and solar. How many more shocks can we have? We must look for more and more opportunities to collaborate.

Roundtable Plenary

Session: Research Program Design for Complex Challenges, Panel Discussion

Moderator: Dan Boger, Dean of Research NPS

Speakers: YEOH Lean Weng, Director C41 Development and DSTA Systems Architect, DSTA, and Starnes Walker, Director of Research DHS



Summary of YEOH Lean Weng's Comments

Singapore is the largest international trans-shipment hub. There are regions of natural concealment and blind spots which can be exploited by terrorists. Meanwhile, due to the risk of information overload, the classic notion of situational awareness as a solution is erroneous. We must therefore improve prevention, protection, and response through the relationship between technology, education and research. International collaboration is critical in this. Numerous technologies should be utilized, including the Harbour Craft Transponder System (HARTS) and container scanning. New technologies are needed in multi-agent systems for augmented cognition, models and profiles of shipping behavior, and surveillance, including step angles and wide vision.

Key Points from YEOH Lean Weng

- Maritime Security: The Singapore Environment
 - largest trans-shipment hub
 - world's 12th largest trading nation
 - Maritime in 7% of GDP, 500 ships/day, 200,000/year
 - natural concealment and blindspots
- Maritime Threats: Terrorism
- Pro-active approach to port security: an information challenge
 - classic notion of situational awareness is erroneous
 - evaluating intent is critical
 - need for timely and rapid response
 - risk of information failure
- Prevention, Protection, Response
- Technology, reduction and research relationship
- Implementation/Infrastructure Experimentation/Technology Exploration
 - Information fusion
 - Harbor transponders system
 - Role of international collaboration, Tuas Naval Base, C2
 - Harbour Craft Transponder System (HARTS) for < 300 tons
 - RAHS Experimentation Center (collaborative Risk Assessment research)
 - Container scanning
 - WISEPORT (Wireless Broadband Access at Seaport)
 - Multi-Agent System, detection systems, underwater, acoustic
 - Persistent/Pervasive Sensing: airborne sensing
 - Stopping a large hostile vessel without inflicting collateral damage
 - Free electron laser, miniaturized
 - Improved explosive devices
 - Improve Cyber Security
- Need to continuous seek new solutions to new issues
- Think far ahead

Summary of Starnes Walker's Comments

The Department of Homeland Security is “an experiment in nuclear fusion” in bringing so many agencies together. Technology can be the integrator. We must be prepared for both man-made and natural disasters. Our adversaries are constantly looking for WMDs. Even so, our security measures must not interrupt commerce. We would benefit from a threat “tri-corder” that we don't have yet. In other words, early detection is better than fighting wars. International bilateral agreements will be key in this, including cyber-security.

Key Points from Starnes Walker

- DHS is only five years old
 - “an experiment in nuclear fusion”: bringing so many agencies together
 - use of Integrated of Product Teams (IPT)
- DOD, DOE, NSF, intel community are primary customers
- technology is the integrator
- should have strategic and enduring thrusts of research
 - Borders and maritime
 - Human and physical domainman-made and natural disasters
- the adversaries are constantly searching for WMDs
 - Chem, Bio, High-explosives, nuclear
 - container security, both air and sea, smart tags
 - need to avoid interrupting commerce
 - improvised explosive devices, a “weapon of mass influence”
- What are the systems?
- work with FBI
 - looking for “silver bullets” don’t have yet
 - would love a threat “tri-corder”
 - better to move in that direction than to fight wars
- Navy response to Tsunami was wonderful
- interoperability a key issue, focus on “.gov” internet domain
- signed international bilateral agreements with several nations
- collaborative project in-work
 - sharing within the global security environment
- challenges are over-whelming, but we are up to it with our partners
- we have to be nimble in a dynamic world

Q & A Discussion

There are difficulties in integrating human factors with technology, in human-systems integration. For example, avoiding overload from the fusion of many sensory networks coming together. We need not just information-sharing but also perspective-sharing capabilities. Otherwise, we just defend a position. We can’t simply pursue a technology solution; sometimes it must be a policy decision, for example, going up and down multiple chains of command. We need more information which is relevant on a human-to-human basis. Both technical and human solutions must be integrated.

In training sonar operators, the Navy selected just the 2% of that out-performed the others as specialized trainers and evaluators. Could this model be applied? The training aspect is an art, not just a science. For example, it’s very difficult to have first responder training in-depth. Budgets are very limited. It’s not embraced as much as we would like. Down-selecting and training will always be important, but technology can help a lot, if the shared user interfaces are intuitive.

To build bridges with first responders, we try to work within the professional organizations because they understand the range of experience. We leverage partnerships and joint exercises.

How do we deal with the concept of meaning, what the information means? This relates to perception of risk, as well as value systems. We need to understand the culture of the people we’re working with. We must have an operational term dictionary, a semantic web. Situational awareness should be embedded in cultural awareness. Many first-responders have law-enforcement backgrounds. In the IPT process, the first responder is sitting at the table. They can say, “This is what I really need.” This gets the operational construct into the science and technology (S&T) work.

How to do systems integration on individual crisis events vs. longer-term globalization issues, using deliberate planning? Modeling and Simulation (M & S) is a key tool, performing what-if analysis. We go through scenarios to learn, but it is just a tool. Realism is dependent on input. We can learn a lot from simulations if we set the parameters carefully. We use multiple university research centers which are at work on this. How can we do simulations across organizations and platforms?

Session: Lunchtime Speaker

Summary of DASD Greg Gross' Comments

Maritime security has always been important, but the complexities of globalization are making it even more important, for example, in dealing with piracy. No nation can do this alone. We need more flexibility and the ability to bring new partners up to capacity. The new Sections 1206 and 1207 of the National Defense Authorization Act will help. No agency can do this alone, requiring increased inter-agency cooperation which has been elusive in the past.

Key Points from DASD Greg Gross

- Maritime security at the heart of my work and so many others
 - a topic for all Navies around the world
 - each region has its own complexities
- a timely conference
 - new implications of piracy
 - maritime security as an issue since the birth of our nation, need of free commerce, WW I, WW II, Cold War
 - security issues that we now are taking on were seen as “too complicated” before 9/11
- 70% of the world is water
 - many key allies rely on shipping even more, e.g. Japan
- the U.S. cannot do it alone, State Dept. plays key role
- power projection more key now
- enormous complexity in each country, legal arrangements, detainee issues
- what we're doing in DoD partnership development
- how do we quickly respond to bring partners up to capacity? Some examples of experience working internationally:
 - Georgia, Pakistan, Poland
- Need more flexibility to do this
- 1206 and 1207 statutory capability were established, “grass roots” programs
- required enormous cooperation between agencies
- been used in Indonesia, Malaysia, Caribbean, etc., multiple maritime situations
- extraordinary collaboration with Singapore and neighbors, in part due to these new funding paths.
- do we really want to go into Mogadishu to get the pirates?
- dealing properly with detainees
- redesign of our Co-COMM planning process is working
- inter-agency work will now be the way of life, private sector also involved

Q & A Discussion

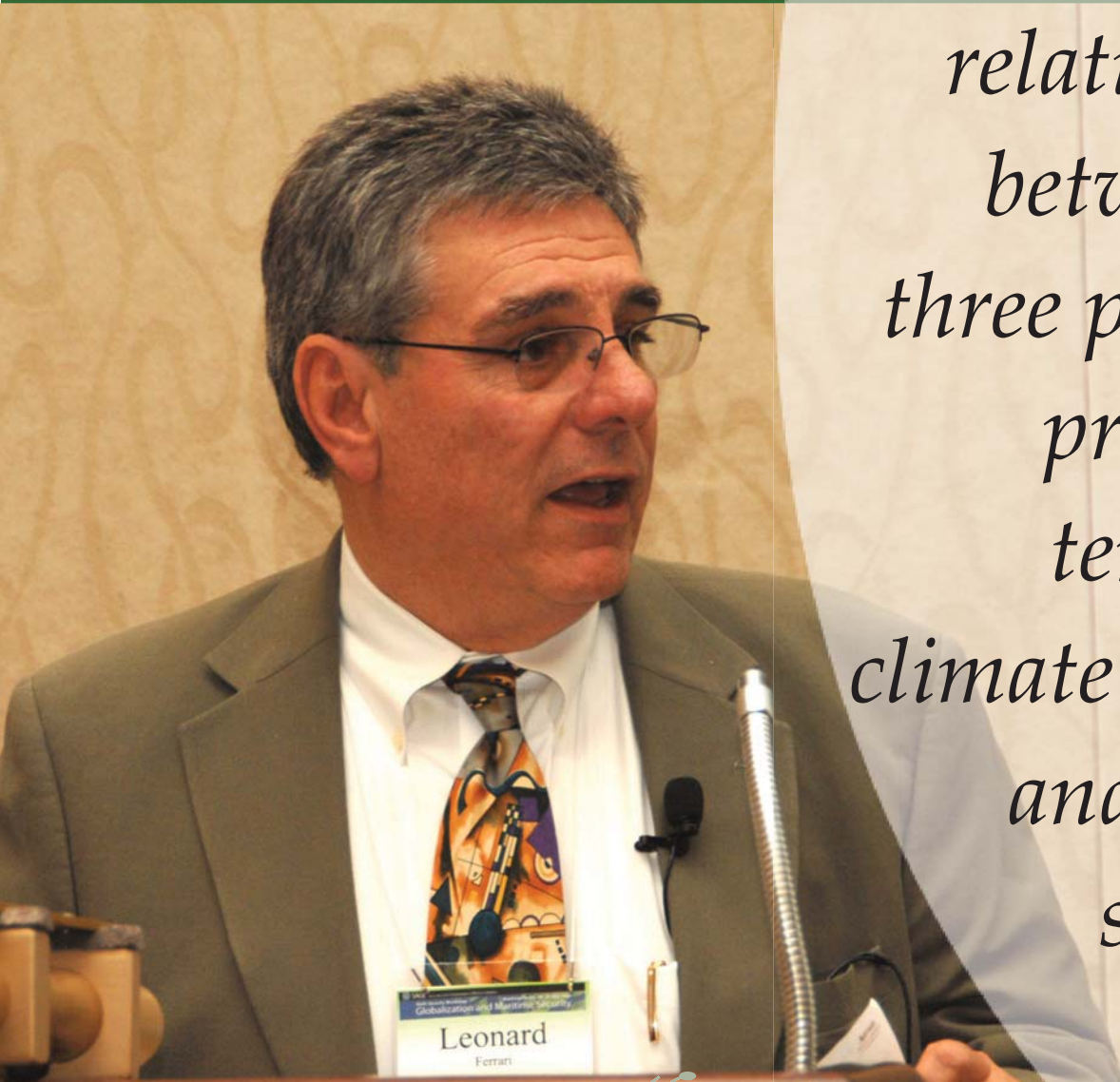
Joint Operations Planning starts with end-state goals, and war planning comes off of that. War planning tends to be more crisis planning. So what do you do if you don't have a crisis or war surge need?

Some key lessons learned from collaborations so far have been that certain countries were drivers in the collaborations and others came second. This was true in the private sector and NGOs, as well. In the 1206 program we offer other countries what we think they need and listen to their needs.

The issue of building understanding with impoverished nations when the U.S. is used to abundance. Building understanding is a lot of different things at multiple levels. We need to build partner capacity at home through educational opportunities, networking outcomes, and counter-terrorism professional network-building. This is a complex, long-term process, built relationship by relationship. We have been able to see actual results from these efforts now, training police and youth.

Day 1: July 29

*There are inter-
relationships
between the
three problems
presented:
terrorism,
climate change,
and energy
security.*



Session: Globalization Systems

The Globalization Systems project is about mapping systems such as food security or energy so that we're not simply reacting to the consequences of globalization but identifying the causal linkages. In an informal survey, interest was expressed around the topics of climate change effects, poverty, and governance issues.

Chair: Leonard Ferrari, NPS

Presenters

Sujoyini MANDAL, "Globalization of Violence: Terrorism and the War on Terror"

Justin Locke, "Climate Change-Induced Migration in the Pacific Region"

Alvin CHEW, "From Energy Security to Social Security"

Alexandre Hedjazi, "Geopolitics and the Caspian Sea"

David Smarsh, "Assessing National Security Impacts from Global Climate Change—A Survey"

TAN Yeling, "Asia and Globalization"

Session Summary

- The globalization of violence requires managing information flow and monitoring the good and bad of virtual communities. How do we know if we are winning the war on terror?
- Island nations serve as "canaries in the coal mine" for the effects of climate change. As communities become at risk, migration increases, which leads to over-population, which puts pressure on other nations to formulate a policy response. Multilateral agreements are the only solution.
- In many ways, security is about energy security. Three aspects pertain: supply security, economic stability, and sustainability. We must reduce usage, diversify our sources of energy, and build mutually beneficial energy interdependence.
- The Caspian Sea is a regional Security-Insecurity nexus, a poster child of a mismatch between sector-based security and security of the region. We must develop more human-centered security as opposed to state-centered security.
- Climate effects act as a political threat multiplier. We need to develop a World Climate Watch Tool.
- Researching global governance around Energy and Climate Change, Public Health, and Finance. Pathways to nations solving problems together are lacking. What is Asia's role? We must include non-state actors in these efforts.

Leonard Ferrari

- what are people going to do in each region
- externalities, extra-order effects, hidden costs
- how do we pay for these costs?
- trade-offs between economics and security
- people seem to be extremist in their views, black and white, a mistake
- Gen. Casey's speech, his concerns
 - both positive and negative impacts of globalization
 - energy stability
 - climate change, esp. poorer nations
 - climate should not be a political issue
 - WMD
 - failing states that can provide safe-havens for terrorists
- Singapore particularly susceptible to both climate change and maritime issues

Sujoyini MANDAL, "Globalization of Violence: Terrorism and the War on Terror"

- an age of fear and securitization
- the security discourse, 9/11
- challenges posed by globalization
- universality of terror
- Sept 11, War on Terror and Security
 - globalization of violence
 - nation states appear to be loosing
- challenges posed by globalization
 - fast information flow
 - rising power of virtual communities
 - ability to overcome the "tyranny of geography"
- Universality of Terror
 - is it a civilizational conflict?
 - incompatibility of Islam with modern world
- The Age of Fear
 - structure of terrorist is more nebulous, more free-flowing, decentralized
- Al Qaedaism
 - nimble, adaptive
 - Jihadists' sense of commitment is higher than ever
- Connecting People
 - rise of virtual communities
 - helped spread extremism on-line
 - the "home-grown Jihadist", 5600 jihadist websites, only 20–30 really active
 - increase by 7000% in last few years
- Extremism and the Internet
 - Static website --> Forum technology --> 3D world of Second Life
 - recruiting, fundraising, training
- Universality of the 'War on Terror'
 - 'One size fits all'
 - 'either you are with us or you're against us'
 - perception for a new world order
 - "We lack the metrics to know whether we are winning the war on terrorism."
- Use of Force
 - legitimized use of force by nations
 - democracies and civil liberties have suffered
- Terror Affect All: The importance of institutions
- What do we do now?
 - realization that terrorism affects all



Justin Locke, "Climate Change-Induced Migration in the Pacific Region"

- working on topic for 6 years
- The Disaster Dichotomy
- Climate events vs. climate processes
- IPCC looked at 80cm rise prediction
- Coral reefs the most sensitive to climate change
- affect fishing stocks and shore erosion
- increase in ocean acidity
- Secondary Impacts of Climate Change will have greatest effect
- affects human migration
- Kiribati
 - 65K people
 - over three economic zones
 - people migrating southward
 - can't move inland as much anymore
 - potable water supply rises and becomes more brackish
 - people move
 - resulting population density on Tarawa is equal to Hong Kong
 - poverty is increasing
- Tuvalu
 - 12K people
 - globalization pulled to central island for economic reasons
 - now people are being pushed to the central island
 - an imbalance between people and resources
 - Literacy rates among young girls are decreasing
- grim predictions of a "domino effect"
 - climate change --> communities at risk
 - --> migration --> over population --> policy response
 - the policy response doesn't affect climate change root causes
- NZ is relocating some Tuvaluans
- roughly 1 million people live on coral atolls
- loss of cultures
- costs for recipient states
- international law does not give climate refugees refugee status
- focus on adaptation for climate change
- bilateral agreements are the only solution
- island nations serve as global "canaries in the coal mine" for climate change
- multiple cities would be affected
- need to use a more holistic approach to problem solving



Alvin CHEW, "From Energy Security to Social Security"

- many inter-related issues: climate change, food issues, pandemics
- energy security is nothing new
- three aspects of security: "The Three Ss"
 - Security of supply, stockpiling
 - Stability, economic stability
 - Sustainability issues
- growth continues, while oil and gas are finite
- financial institutions increase prices through speculating
- What can be done?
 - reduce usage: easier said than done
 - diversifying our energy mix, renewables
 - energy interdependence as opposed to independence

Q & A Discussion

There are multiple inter-relationships between the three problems presented.

Why has terrorism evolved now? Why this group of people? 9/11 set up a huge series of subsequent Islamic acts. Events have infuriated Muslim populations. So there are many more avenues for terrorists to use.

In terms of local climate issues, the world population will be 9 billion. Therefore, people can't migrate to deal with problems as much any more. It becomes more of a macro-level problem. For example, ocean acidity is having more effects than temperature.

The issue of how to globalize policy issues. The effects of mega-cities near the oceans. We need to change the way we account for environmental changes. Small nations don't have as much funding for their needs. They will need international help. There is a lack of proposals to make the hidden costs visible. This is a very important point. If you use a model of future costs, you change everything. This is an important research question. How do you do this? Our current corporate legal structure puts externalities beyond the corporation.

Technologies can provide new alternatives. For example, investments in alternative energies are increasing around the world.

Alexandre Hedjazi, "Geopolitics and the Caspian Sea, New Canon of Security"

- Global economic and political world order
- high interconnectedness and dependencies
- Security Issues
 - markets are more integrated
 - resource scarcity
 - climate change
 - how to adapt to impacts?
 - triggers new conflicts
 - more volatile political environment
- The security debate
 - state-centered approach vs. human security approach
 - United Nations Development Programme (UNDP) report in 1994, interrelated issues
- the case of energy security
 - developing world will be consuming the most, especially China and India
- Demand-induced scarcity
- Supply-induced scarcity
 - multi-layered problems
- Geopolitical aspects that affect the market
 - both role of supplier and recipients
- The geopolitical paradigm of Energy Security
- Security of the Caspian Region
 - “the heartland of the heartland”
 - Caspian source of power
 - control of Eurasia
- Caspian sea as a poster child of mismatch between sector-based security and security of the region
- The Baku-Tbilisi-Ceyhan (BTC) pipeline and the Caspian Swap Test
 - virtual access with Moscow and Iran
- Regional Security-Insecurity nexus
 - many disenfranchised populations
- North-West and East-West tensions, lack of shared approach
- Conclusion: paths to security cannot be based on existing topologies

David Smarsh, “Assessing National Security Impacts from Global Climate Change—A Survey”

- Background, Need, Solutions, Pay-off
- disasters will be more intense with climate change
- Myanmar’s lack of desire for help
- there are still many things we don’t understand in atmospheric processes
- what are the other players?
- climate effects act as a political threat multiplier
- melting ice cap creates new sea lanes that are security issues
- What is the current state of the science?
- What are the drivers? Security impacts?
- How can we improve our suite of tools?
 - USAF and USN do not spend a lot of money in climate research
- Solutions
 - survey of global climatic change
 - World Climate Watch Tool
- Operational Pay-Off
 - be able to better plan in the future
 - Service chiefs can better integrate planning



TAN Yeling, “Asia and Globalization”

- Mechanisms of governance
- none of the problems can be solved by any country alone
- pathways to do so are lacking
- need a new approach to global governance
- how can the global community take effective action?
- what is Asia’s role?
- Concepts on Global Governance Study Group
 - discourse between East and West, roles of state and non-state actors
- Energy and Climate Change Study Group
 - no viable governance mechanism to address the issues
- Global Public Health Study Group
 - more actors on the issues but un-coordinated
 - no global reporting system
- Global Finance Study Group
 - current systems is antiquated
- New Modes of Governance in Asia
 - inclusion of non-state actors in the process
 - region-wide accountability
 - a blurring of national borders and levels
 - role of Asian Development Bank and World Bank
 - regional integration process
- Energy side
 - Institutions for global energy governance: there are none
 - G8 and others are very selective and narrow in scope
 - Asian nations must play a large role
 - could help nations address issues that they cannot on their own
 - balancing consumption and resources
 - interplay between human rights and energy
 - Research on national policy and renewable energy

Q & A Discussion

Recommend looking at the work of the Rocky Mountain Institute. Hold the belief that military career fields should change as the world changes. The U.S. National Oceanic and Atmospheric Administration (NOAA) does this. We should have a global climate watch, for example, having a GoogleMap of the world that would allow you to drill down into effects.

We must include both a human-centric and state-centric view. The state model denied the human-centric need, for example, Georgia. This was not planned in a very comprehensive way.

We must speak to different countries in different ways. Are nation-states the right level to deal with the problems, vs. trans-national or grass-roots? Is using the nation-state as the starting point the right place to start?

It's hard for nation-states to globalize. What is happening to the relevance of the nation-state?

Borders between nations do not correspond to the problems we face. Is there a growing disconnect between the needs of the nation-state and human needs? What is economic sovereignty? What is sovereignty? What is governance?

States are not becoming more irrelevant; they are becoming more relevant because they are the primary model of governance and systems.



Session: Trends, Shocks, and Prevention

The Trends, Shocks, and Prevention category showcases leading research on shocks and trends, some of the work we've been doing on metrics for stability, and work by the Swiss and the US State Department prevention unit. What are the major systems involved in our priorities for research with respect to trends and shocks that will shape the security agenda? What are the implications for a prevention agenda?

Chair: Lin Wells, National Defense University

Presenters

Nicklaus Eggenberger, "Anomie as Predictor"

Mike Pryce, "Mass Atrocity Response Operations"

Scott Tousley, "Complex Security Assessment"

Don Noland, "Energy for the Long War"

Dan Plesch, "New Challenges, Forgotten Wisdoms: lessons from America's creation of the United Nations to beat Hitler and secure the peace"

Session Summary

- Anomie as a predictor of security threats. How to measure? Research could lead to an early detection mechanism. There was strong interest in pursuing this topic further.
- How to develop military doctrine for disaster operations such as genocide or mass atrocity? Working to offer a planning framework.
- No longer war vs. peace, but a spectrum. We therefore need an adaptable response.
- Using the Measuring Progress in Conflict Environments (MPICE) model to help organizations measure degree of stabilization in hostile areas. Trying to quantify the common operational picture for multiple actors, including Non-Governmental Organizations (NGOs).
- The real "long war" comes back to oil. Using existing and emerging technologies to reduce the military's power consumption in forward areas. Government can incentivise the process.
- The fight against Hitler was legitimized under the banner of the UN after its creation in 1941. This mostly forgotten lesson can help us re-evaluate strategic culture in the present, for example the role of the World Bank.

Nicklaus Eggenberger, “Anomie as Predictor”

- Rationale
 - Globalization
 - Culture
- Logic
 - Conformity/Creativity
 - Innovation
 - Ritualism/sect formation
 - Macro/micro levels,
 - How to measure anomie?
 - attitude surveys?
- Anomie scales
- Attitudes precede behavior
- Independent, Intervening, and Dependent variables
- Findings
- The Output
 - possible early detection systems
 - describes a potential “bomb”

Q & A Discussion

Suggestion that this approach be taught in all military academies.

Anomie is not only about negative feedback and social disorders. It is not an inherently a negative term. It depends on pace and scope.

Anomie does not predict individual or population behaviors. Can only work with the aggregate, by trying to work with patterns.

The level of resources required to study anomie depends on the local situation.

Mike Pryce, “Mass Atrocity Response Operations (MARO)”

- Carr Center for Human Rights, Harvard
- funded by Humanity-United
- must refine our response to genocide
- we don’t have any military doctrine for disaster operations
- study historical record
- to learn how to respond to genocide and mass atrocity
- interested in tactical applications
- offer a planning framework
 - take a very complex problem and break it into simpler elements
- completed planning framework draft
- plan to launch in 2009
- only a prototype

Q & A Discussion

Ultimately, we are getting to the point that commanders will need to be trained on this.

We are beginning to start a framework to look at consequences. We don't have a nation of people who "know how to play chess." The military is a one-off solution. Lawyers are a one-off solution. We need to look at the consequences to the community.

The value of looking at the Army's career incentive plan as an example.

We need to address these issues by using an international approach. This is just the military side of it.

What would this plan have done about Burma? This approach prevents politicians from blaming (rather than using) the military due to lack of procedures, which is a resource argument. It becomes a political commitment argument.

Table Discussion Report-Outs

- Multi-stakeholder approach need to be standard
- no longer war vs. peace but a spectrum
- need to identify internal political potential of moving forward
- balance between population and resources
- need to carry anomie conversation forward
- look at history of globalization
- give us new tools for looking at uncontrollable change and leading to violence
- looking at consequences and adapting response
 - not looking at victory and peace but interdisciplinary groups and teams
 - have an array of approaches and consequences
- role of a time-dimension, when will conflict occur?
- issue of prevention, how to measure if something didn't happen?
 - e.g. Y2K
- information flow issues
- role of choosing response of the culture you're in, what is "normal"?
- different approaches to learning are useful for different groups
- working with people where they are
- thinking about what to do about dynamics of anomie
- research agenda is overwhelmingly military, i.e. planning. What about State, and others?
- What are the functions of the soldier in the future? Based on old eras. What are the implications?



Scott Tousley, “Complex Security Assessment”

- Measuring Progress in Conflict Environments (MPICE)
- e.g. Iraq
- help J5 organizations to measure stabilization in hostile areas
- use Quest for Viable Peace framework for sustainable peace
- Framework structure
- data planning
- built some very simple software
- case study: Afghanistan, Sudan, Haiti
- From assessment to planning
 - Why did we do Assessment work first?
 - How do you integrate across multiple organizations?
- too U.S. bureaucratic-centric
- must work for random international NGO, too
- Activity (licit/illicit) structure
 - if you start measuring “black to grey” is that useful in wanting to measure “white” (good)
- Geographical/Information structure
- Maritime Domain Awareness: Essential Tasks
- Common operational picture needs meaning
 - not looking for needles in haystacks but systemic structure
- have to get into complex planning

Q & A Discussion

We do not use the Failed States Index because it's proprietary.

We are getting better at trying to understand the relationship between NGOs and military. There is the ongoing issue of overcoming inertia.

A shared forum for information sharing from modelers on this issue exists, but it needs to grow.

Dan Nolan, “Energy for the Long War”

- I'm a business guy
- what is the real long war
- all comes back to oil
- Clausewitz
- Rocky Mountain Institute: Winning the Oil Endgame
 - a think and do “tank”
- the tactical problem
 - electrical power
 - what is expeditionary power? Can't rely on long lines of trucks
- spray insulation on tents to save energy
- cost \$20/gal. to get gas into middle of Iraq
- it's the tip of the iceberg
- can we use renewables instead?
- a little bit more expensive, but much cheaper in the long run
- Oil = bad, green trees = good
- energy inter-dependence as opposed to energy independence
- a national security issue
- need and equivalent of “nuclear Trinity test”: operational test of our technology
- portable light tower efficiency
- must be whole system
 - demand reduction + renewables
- government can incentivise the process

Dan Plesch, "New Challenges, Forgotten Wisdoms: Lessons from America's Creation of the United Nations to Beat Hitler and Secure the Peace"

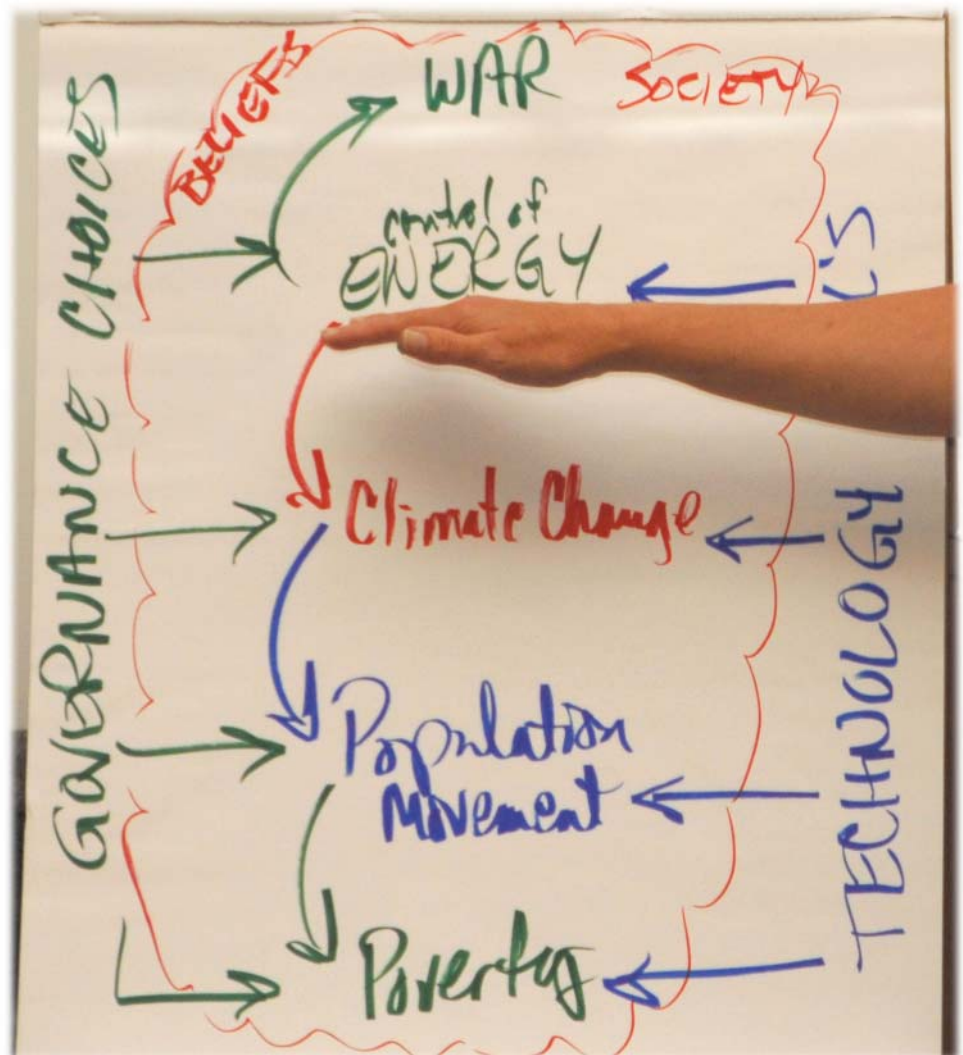
- "We know how to do it, but we forgot."
- genesis of UN: the Atlantic Charter of 1941
- Declaration of UN, 1/1/42
 - human rights and justice
 - 26 states
- Germany surrendered to the UN
- UN term used throughout WW II
- Preventing Starvation
- War Crimes Justice
- UN role in Reconstruction
- Social-Economic Stability
- Security, United Nations Conference on International Organization (UNCIO)
 - inclusion of women
- Conclusions
 - we fought WW II under the title of the UN
 - full spectrum of systems
 - necessary
- Research Agenda
 - need to re-evaluate strategic culture

Q & A Discussion

We need to re-evaluate the economic commitment to UN. We've forgotten the origin of these structures. We aren't thinking about the World Bank as a conflict prevention tool.

This Euro-centric-formed institution could become more relevant by building on the creativity of adding China to the security council.

We are trying to create international systems to help regulate national processes. It's very hard to start new organizations.



Day 1: July 29

*Can advanced
technology help
to ensure port
security? How
can we assess its
effectiveness?*



Session: Straits of Malacca and Singapore: Port Security I

The Port Security project is intended to assess advanced technology for port security by assessing the effectiveness of advanced sensors and defensive technology, integrated with existing assets to create higher levels of security. Methodologies will be developed and analyses performed for assessing port security threat levels, risk assessments, organizational roles, and investment strategies for improving port security.

Chairs: Tom Huynh and Don Brutzman, NPS *Presenters*

John Hiles, "MAST Prototype and Digital Swarming"

CHUNG Wai Kong, "Maritime Security Issues"

Gary Langford, "Maritime Interdictions in a Logistically Barren Environment"

LIM Horng Leong, "Persistence Surveillance"

Ken Davidson and Tom Huynh, "Field Tests of Coastal Surveillance System of Systems"

Michael Matson, "Maritime Security Patrol Craft: System of Systems Approach"

Session Summary

- How can we utilize decentralized, internet-based, self-organizing technologies to support security decision-making? How will an intelligent actor behave in a particular environment?
- How to automate mining the overwhelming amount of data available to detect threats? The multi-agent arena is too complex to analyze as a whole; we must break it down into smaller problems.
- Researching how to improve Maritime Interdiction Operations (MIO). Use of simulation to determine areas to be improved. Desire for hand-held technology solutions to expedite vessel searches.
- Is persistence surveillance possible for pirate and small boat attacks? Use of UAVs and other technologies can help. Question of whether sensor data should be centralized or decentralized.
- Using the detection of low radar emissions for coastal surveillance.
- Developing efficient Maritime Security Patrol Craft. M-Hull design uses air to reduce resistance with water. Partner Command and Control coordination is a critical part of a system-of-systems approach.

John Hiles, “MAST Prototype and Digital Swarming”

- Distributed Control and MAST
- Rapidly forming groups in military and security operations
- Internet based technologies to support decision making
- Self organizing group online—Internet and mobile phone networks
- Groups spring up around common interests
- Book mentioned: *Here Comes Everybody* by Clay Shirky
- Games played by millions of players—self-organize effectively—lessons can be applied to military operations
- Appearing over multiple domains
- Centralized vs. Decentralized network architecture
- How will an intelligent actor behave in a particular environment?
- Dynamic Maps used to track possible threats
- Island of functionality can be limiting ‘ceiling’ of the system
- Bigger challenge is how to get different systems to work together

Chung Wai Kong, “Maritime Security Issues”

- Straits of Malacca are <3 mi at narrowest point
- Situational awareness increasingly difficult to contain terrorist threat
- Range of responses to terrorist threats must be considered
- Flow of accurate information critical
- Real problem too complex to analyze as a whole—break down into smaller problems
 - Multi-agent system
- Data mining tool
- Pattern recognition using algorithms
- Multiple sources of data incorporated into model
- Shifting from manual to automated—data organized in a manner that automated systems can process



Gary Langford, “Maritime Interdictions in a Logistically Barren Environment”

- 46 people participated in this study/project from various countries
- MIO—Maritime Interdiction Operation
- Airborne, Submarine, Surface actions/assets available for interdiction operations
- System of systems designed to employ regional MIO
- Level 1 or 2—compliant
- Mother ship subdues noncompliant ships
- One or two interdictions simultaneously possible with mother ship backup
- MIOs can be improved with technology
- Larger ships more difficult to inspect for threats/illegal equipment shipments
- Improved biometrics, search strategy would help MIOs
- NPS report available via online request
- Most effective thing to improve MIOs—use small electronic device to look for multiple items to reduce search time by ~2 hours/search
- Operations done with modeling simulation software
- 99% vs. 95% probability of detection to determine time required for search in each case
- Nominal probability of detection 95-96%, ~15% estimated error in model
- Crews often uncooperative but following orders
- Have to pick and choose which containers to inspect
- Goodwill items passed out to crew
- Generate intel for follow-up based on data collected

Lim Horng Leong, “Persistence Surveillance”

- Is it possible? Threat analysis conducted for a small boat attack vs. pirate attack
- Modeling software/toolset for Maritime Interdiction and Surveillance Assessment
- Use UAVs for mobile surveillance
- 50–60% interception possible with persistent surveillance—how to improve?
- Automatic anomaly detection, trace origin of attack, and capitalize on intel operations
- Future studies to determine effects of weather, platforms, sensors, operations and sustainability of continuous surveillance—is it cost effective?
- Sensor data centralized or decentralized? Decentralized would improve data processing
- Pirates will react to surveillance operations



Ken Davidson and Tom Huynh, “Field Tests of Coastal Surveillance System of Systems”

- Testbed detects low radar emissions
- Data input into fusion engine, then to propagation and effects models, probability of detection plotted
- Testbed used to improve algorithms for low radar cross-section (RCS) identification
- Field of telescopes to be implemented
- Ocean surface waves need to be taken into account

Michael Matson, “Maritime Security Patrol Craft: System-of-Systems Approach”

- Follow-on of SCA 13 masters-student group project
- Cost-effective vessel needed to support maritime security
- Vessels must be able to enforce laws, communicate with other navies, entities effectively
- M-Hull design uses air to reduce resistance with water
- Threats from terrorists, pirates, lawless individuals/groups
- Look at requirements of vessels to prevent attacks and/or neutralize threats
- Capability of MIO search and seizure needed
- Partner Command and Control coordination a critical part of system of systems approach
- SCA 14 discussed
- Details of hull provided in slideset—higher speeds possible even with shallow draft
- New technologies being considered with greater propulsion capability for a given volume
- Requirements document needed to determine key requirements for maritime security
- Onboard security forces assume responsibility for security under various treaties



Session: Straits of Malacca and Singapore: Port Security II

Security for the Straits of Malacca and Singapore project will assess the effectiveness of a system of systems, which include multi-national land-based, surface, underwater, airborne, and space-based platforms, sensors, C4I centers, weather centers, shipping companies, and international and private maritime information organizations.

Chairs: Tom Huynh and Don Brutzman, NPS

Speakers

Gabriel Elkhaim, "Multi-Vehicle Patrol and Force Protection"

KHOO Boo Cheong, "Real-time optimization for the prediction of free surface shape water barrier: Remote acoustic-underwater bubble dynamics"

LIM Leong Chew, "Compact Broadband Underwater Projectors for Littoral Water Applications"

Gary Horne, "Maritime Security Applications for Data Farming"

Gary Langford, "Value Systems Engineering Applied to the Terrorist Enterprise"

Don Brutzman, "Web-based Modeling, Simulation and Visualization for Maritime Security"

Session Summary

- Impact of pirate attacks is \$16 billion annually and likely to increase. Meanwhile, most countries lack the resources to police their own waters. Latest unmanned aerial vehicle (UAV) technologies can help.
- Research on how acoustic-underwater bubble dynamics can assist in threat detection. Will use simulations to determine design effectiveness prior to real-life demonstrations.
- How to create compact, low-power acoustic projectors to detect and track targets.
- What techniques can be used for effective data farming for both assets and potential threats? Trying to standardize existing models.
- How to apply value-systems engineering to analyze terrorist organizations, from those who are unfunded to those with the capacity to barter?
- Building web-based models for simulation and visualization of Maritime Security. Integrating satellite data sets using X3D software. More collaboration will improve the modeling.

Gabriel Elkhaim, “Multi-Vehicle Patrol and Force Protection”

- Overview of pirate attacks presented
- ½ world's oil travels through Malacca Straits
- Pirate attacks cost \$16 billion annually, likely increasing
- Many countries lack resources to police their own waters
- Piracy is high profit and low risk
- NPS work on UAVs discussed
- Wing Wind Interaction is self-trimming and controlled aerodynamically
- Hybrid Propulsion Control use independent control systems 29:1 reduction in power consumption—allows for long range missions
- limited by bio-fouling rather than availability of energy for propulsion
- Sea state 6 tested—force measured to help design more survivable unit
- Next generation will be on hydrofoils
- Sensor package can be added (at expense of speed)
- To avoid other vessels, radar or AIS will be used to detect other vessels (power vs. cost vs. fidelity)
- Classified as either a sailboat or vessel under control for Rules of the Road operations

KHOO Boo Cheong, “Real-time optimization for the prediction of free surface shape water barrier: Remote acoustic-underwater bubble dynamics”

- Sea-skimming missile can be detected ~1 minute out
- Pirates often function as local fishermen
- Equations and analysis of optimization using POD simulation shown in slideset
- Bubbles used to elevate water level around ship
- Type of water composition inconsequential
- Shallow water greater effect
- Power requirements for 1–2 meter diameter bubble will create 5 meter high
- Focus ultrasound can be utilized
- Possible environmental issues with wildlife?
- Simulations can be done to determine effectiveness of design prior to real-life demonstrations
- 1–2 km required to stop large-sized ship



LIM Leong Chew, “Compact Broadband Underwater Projectors for Littoral Water Applications”

- Detection of underwater threats in harbors and ports—broadband underwater acoustics desirable
- Power requirements require large volume by comparison of overall size of UAV
- Higher frequencies require higher max input power
- Goal requires new piezoelectric materials
- PZN-PT Single Crystals
- 180 dB achieved with only 17 watts power, temp increase <2 degrees
- More sensitive to picking up and tracking targets

Gary Horne, “Maritime Security Applications for Data Farming”

- Simulation Experiments & Efficient Designs (SEED) Center for Data Farming
- <http://harvest.nps.edu>
- Agent-based models and computing resources previously used to analyze data (1990s)
- Golden words of data farming: “what if?”
- Two application areas: assets and potential threats
- International Data Farming Workshop (IDFW) 17—Germany, 21–26 Sept 2008
- Non-lethal Capabilities in a Maritime Environment
- Reviewing models already out there for standardizing

Gary Langford, “Value-Systems Engineering Applied to the Terrorist Enterprise”

- Source of funding, adaptability, strong social networks and economics of networks provide support
- Unfunded attackers—attract attention, be persistent
- Value Chain Integrator—most dangerous organization, someone who has one-stop shop
- Objective exchange value—capacity to barter
- How does this system compare to al Qaeda’s approach—value analysis suggests that there is an additional dimension to various targets selected (e.g., Library of Congress)

Don Brutzman, “Web-based Modeling, Simulation and Visualization for Maritime Security”

- New scientific method: Simulation corresponds to an experiment; model implements a theory
- Virtual environments cross-connect models and simulations
- Scenario Authoring and Visualization for Advanced Graphic Environments (SAVAGE)
- Visualization confirms what models suggest
- X3D software building Earth models
- Meshing data sets using X3D Earth software
- Greater collaboration will improve modeling
- <http://x3d-earth.nps.edu>

Day 1: July 29

*How do we
bring
technology
to bear to
help address
our security
challenges?*



Plenary

Dinner Session

Reception at Army-Navy Country Club

Speakers

NPS President Dan Oliver, VADM USN (Ret.) John Kabricky, Deputy Under-Secretary of Defense

Karen Guttieri

- summary of themes: human and technical
- tendency of the policy realm to address quick fix symptoms rather than systemic fixes

Don Brutzman

- how do we bring technology to bear to help address our security challenges
- modeling and simulation
 - use of software agents to play out alternatives can help improve security
 - ability to integrate climate change models might help improve understanding

NPS President Dan Oliver

- NPS is an international crossroads
- NPS touches 100 countries per year
- imperatives
- population will grow from 6 billion to 9.5 billion in the next generation and a half
- Tom Barnette's book, *The Pentagon's New Map*
 - tensions comes from between the "haves" and the "have-nots"
 - if you're a "have", you need to think about how to help the "have nots"

VADM USN (Ret.) John Kabricky, Deputy Under-Secretary of Defense, AS&C

- important to have representatives of the operational commands
- getting over DoD's "Valley of Death" in R&D
- trying to legitimize "the 80% solution"
- STEM: Science, Technology, Engineering, and Manufacturing
 - real need for these field in the U.S. in the future
- office was responsible for Predator and Hawk, UAVs

Day 2: July 30

*Preventing
wars is as
important
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conflict fuels
escalation.*



NAVAL
POSTGRADUATE
SCHOOL

NATIONAL
CAPITAL



Plenary

Session: Case Studies on Prevention and Partnership

The US Department of State is among those agencies keenly interested in conflict prevention. Partnerships are vital to this goal. Programs designed to build resilience to multifaceted security challenges emphasize building partner capacity. US AFRICOM represents a new organizational combatant command structure in order to better address the challenges of prevention. The National Office for Global Maritime Situational Awareness is another innovative civil-military structure to improve maritime domain awareness.

Moderator: Frank Barrett, NPS

Speakers

Cynthia Irmer, Department of State Coordinator for Reconstruction and Stabilization—Prevention
MGEN Herbert “Buz” Altshuler, Director of Strategy, Plans and Programs for US Africa Command
ADM Lee Metcalf, Global Maritime Situational Awareness Office

Summary of Cynthia Irmer’s Comments

Preventing wars is as important as winning wars because conflict fuels escalation. Conflict prevention can be: coercive or deterrent; proactive vigilance; or built on relationships that meet mutual needs. Troops can be surged; relationships can’t. Must get outside of the “us” and “them” and get used to “Games without End”.

Summary of GEN Altshuler’s Comments

Evolving the Five Phase Conflict Prevention Model into the “Four to Zero” Model, where “Phase Zero” is Engagement. NATO peace operations in which young soldiers handed out tri-lingual NATO newspapers to young Bosnians showed that connecting with the people is more important than connecting with governments. It will take an organization. Which one? The UN? AfriCOM is the next opportunity to practice these techniques.

Summary of ADM Lee Metcalf’s Comments

Trying to build the Global Maritime picture through information sharing. There are multiple barriers to sharing information, some statutory, some contractual. So far we have been successful in creating an internet-based platform for 47 countries to share AIS data. This project is opening the door to meeting international partners in terms of their own needs.

Themes in Session Report-Outs by Table

Concern of avoiding a US-centric approach, including using the right vocabulary and maintaining cultural awareness. Importance of a human-centric approach, while being practical about working with limited resources. Must learn to operate in an arena where Competition, Conflict, and Collaboration exist simultaneously. Which organization(s) should lead?

Frank Barrett

- Questions are interventions unto themselves
- Academic narcissism as both a strength and weakness
- bringing different worlds together
- Globalization as contradictory
- today's focus on preventing wars
- a real paradigm shift for military
- must be from a position of learning

Cynthia Irmer, Department of State Coordinator for Reconstruction and Stabilization—Prevention

- ICAP: Inter-agency Conflict Assessment Process, just adopted
- The why, what, how of conflict prevention
- The context
- The practice
- “Preventing wars is as important as winning wars.”
- Why
 - conflict fuels escalation, circular
 - entraps decision-makers
 - encourages collaboration
 - a “chicken and egg” thing, need to “fake it until you make it”
 - start where you are
 - enhances prosperity
 - John Burton, father of conflict resolution
 - humans will fight to the death
 - importance of identity
 - importance of security
- What is Conflict Prevention?
 - Three Perspectives
 - Narrow: coercive or deterrent force
 - Broader: proactive vigilance to avert/diffuse conflicts
 - Comprehensive: Relationships, institutions and conditions in place that meet needs
 - Tools: use of force, mediation, collaboration
- How?
 - Can surge troops
 - Can't “surge” a relationship
- Context
 - Core Grievances + Key Actors + Windows of Vulnerability = Violent Conflict
 - perspectives may appear irrational to others
 - how to prevent? Pour water on the fire? Decapitate organizations and leaders? Someone will take their place. Therefore: build relationships to address core grievances
- Einstein quote
 - Get outside of the “us” and “them”
- Conflict Prevention in Practice
 - Early warning systems
 - and responding
- “Games without End”
 - Cold War had no end
- Analytical Prediction
 - ICAP
- Michael Lund School for Advanced International Studies, quote

MGEN Herbert “Buz” Altshuler, Director of Strategy, Plans and Programs for US Africa Command

- A different approach to Conflict Prevention
- Five Phase Model
 - 0 Shape
 - 1 Deter
 - 2 Seize the Initiative
 - 3 Dominate
 - 4 Stabilize
 - 5 Enable Civil Authority
- Modified Six Phase Model
 - 0 Steady State
 - 1 Indications and Warning
 - 2 Mobilization
 - 3 Operations
 - 4 Stabilization and Reconstruction
 - 5 Transfer to Competent Authority
 - 6 Return to National Control
- Four to Zero Model
 - 4 Stabilization and Reconstruction becoming steady state shaping
 - 1 Indications and Warning becomes Engagement and Information Sharing
 - 2 Mobilization becomes Security Sector Reform
 - 3 Operations becomes Capacity Building
 - 5 Competent Authority is defined and enabled
 - 6 National Control of Sustainable Stability and Growth become Steady State
- The New Phase 0, Engagement
 - Rule of Law
 - Governance
 - Economic Stability
 - Public Welfare
 - Infrastructure
 - Education and Public Information
 - Security Sector Reform
- It takes an organization
 - UN
 - EU
 - African Union
 - OSCE
 - NATO
 - A Consortium of Interested Nations, something we don't have yet
- It takes leadership
 - US Government?
 - Dept. of State?
 - DoD
 - Permanent or ad hoc?
- It is the US?
 - who is capable and willing?
 - maybe leadership piece should be someone else
- Let's get busy
 - Think about it
 - Talk about it
 - Act on it
 - We need a different approach to conflict prevention
- Bosnia
 - 4 years of civil war, genocide
 - 14 Forces arrived in 1995
 - was Commander of Information task force
 - tried to communicate with population
 - our message to the people: the war is over; NATO is here; encourage cooperation to build a democracy
 - distributed a newspaper by hand, engaging the public, in three languages
 - used interpreters and translators, majority under 25 years old
 - wandered through the marketplace
 - best messengers were those young soldiers because they related to those young Bosnians
 - communications started at the grass roots level with those young people
 - that's conflict resolution
 - engagement with the population is more important than the government
- AFRICOM
 - wanted countries to invite us
 - conflict resolution is about connecting with the young people whose future is most at stake
 - it's easy for me to say, there's a lot of resistance out there
 - universal to every country I know that is trying to get off its knees

ADM Lee Metcalf, Global Maritime Situational Awareness Office

- Building the Global Maritime Picture
- information sharing
- Presidential directives
 - catalyst was 9/11
- information sharing across pillars or maritime security: security, safety, environment, and commerce
- work with entire government infrastructure
- mission to facilitate this collaboration
- large consortium of players
- evolving centers of gravity, “the virus slide”
 - organizations making sense of the data
 - OGMSA: exposing more data
- barriers to sharing information, statutory, contractual
- Maritime Domain Awareness (MDA) Stakeholder board to bring all these parties together
- A success story: AIS Info Sharing
 - did not want information to be classified so it could be shared
 - AIS: discrete indicator for each vessel
 - web-based platform contrary to DoD culture
 - keep it simple, open to door to the least capable countries
 - either in or out
 - start with a public information piece
 - gone from 3 to 47 countries
 - simple, secure, and trust-worthy
 - partners even nervous about us cleaning up their data, need to be careful
- Be cautious of a US-centric approach
- now have a platform that can be added to around the world
- this one example has opened the door to exploring what other kind of data we might share, e.g. law-enforcement
- open the aperture: meet international partners in terms of their own needs



Frank Barrett

- need to invent a whole new vocabulary
- can we have a new way of talking about a world without war
 - surge troops but can't surge trust
 - root causes of poverty
 - religious security
 - encouraging collaboration
 - valuing and enhancing prosperity
 - engagement and capacity building
 - preserve the comfort-level of data sharing
 - positive escalation
 - can we escalate collaboration?
 - what is DoD's role in this?

Plenary

Reflections: Report-Outs by Table

- Conflicts are not bad, must be allowed to come out
- relearning lessons from the past, but not simple
- must be people-focused
- what are the things are risk?
- be careful about language in different cultures
- similarity conflict management and risk management
- very important to avoid “one size fits all”
- information-sharing, purity
- human centric, us vs. me approach
- concern with word of collaboration
- how can we research ways to enhance stability before things go downhill?
- presentations were a hallelujah moment
- some language used here is problematic
- using existing int’l entities and NGOs can be problematic: e.g., Myanmar
- issues of perception, self, external, how they perceive you, can shift very quickly
- actions, how deeds are more important than words
- sensitivity to local culture
- issue of capacity-building, arrogant posture possible, in more than one direction
- training for young people in culture and people
- Competition/Conflict/Collaboration exist simultaneously
- liked use of new words
- role of UN?
- how to start chicken and egg nature of collaboration?
- issue of vocabulary
- cognitive blending, AI technique, should be explored
- move beyond semantics to intent
- need to be reflective about American biases, e.g. individualism
- importance of individual leadership
- how to make persuasive arguments in terms of others’ needs
- trust
- triangulation with African research
- engagement with people level is very expensive
- find other ways in, talk about safety not security
- need to be asking “So what?”
- moving from stability to civil society: very fluid, could take years
- what is the end goal?
- when will there be a shared strategy between DoD and State Department?
- use of returned Peace Corps volunteers?
- climate change, effects on Africa, how to take that into account?
- Who leads? What is our responsibility? Who acts at different times?
 - Trust can be destroyed so easily by an un-aligned leader
- stuck in Secure Mode in Iraq, communications restricted
- how to get the information out; can’t share everything; doesn’t help trust
- limited resources, hard to prioritize and implement

Plenary

Session Speaker: DASD Don Loren

Summary of DASD Don Loren's Comments

How can we bring technology to bear on the issues we are facing? The “Techno-Geeks” must meet the “Policy Wonks.” Homeland Defense as DoD support of Civil Authorities. A spectrum of Military and Civilian responses to a spectrum of threats from War to Crime in support of governors and municipalities. This will require unprecedented inter-agency preparedness, including academia. Motivation: if a dirty bomb goes off in Long Beach, CA, the Western US will run out of gas in four days. We don't have a lot of time to figure all this out.

Key Points from DASD Don Loren

- How can we bring technology to bear on the issues we are facing?
- What sensors to develop or apply?
- “Techno-Geeks Meet Policy Wonks?”
- What we're doing here in DC, that you can apply
- Historical precedent, the Federalist
- The US National Security Environment: A Global Set of Threats
 - Nation-states
 - including cyber-attacks
 - Natural Hazards
 - Katrina
 - Transnational threats are the most pressing
 - who is going to protect the pathways to the nation? Navy? USCG?
- We have to merge technologies and policy. How to best apply \$600M/yr.
- US Approach to threats: Law Enforcement Centric
 - What does that mean for DoD?
 - FBI
- US Approach to Threats: Homeland Security
 - bringing together large number of disparate organizations



- Homeland Defense
 - DoD roles within the US
 - Homeland defense
 - Defense Support of Civil Authorities
 - Role National Guard
 - under presidential directive
- Spectrum of Response: Military or Civilian?
 - Maritime Security
 - War <--> Crime
 - Military <--> Non-military
 - DoD has a role in dealing with terrorism
- Homeland Defense & Homeland Security: The DoD Approach
 - We have come to understand our limits
 - Lead: Defend the US from direct attack
 - Support: Provide defense support of civil attacks
 - Enable: Improve partner capabilities
 - enable the Secretary for Homeland Defense to do his job
- Defense Support of Civil Authorities: DoD Definition
 - role of Governors within states for military operations
 - must understand these complexities
- Support of Civil Authorities
 - when civil resources are overwhelmed
 - Active, Reserve, Guard roles
- Pillars of Preparedness
 - Prevention
 - Protection
 - Response
 - Recovery
- Collaboration --> National Preparedness
 - preparation must be two-way with academia and others
- Translating Guidance to Action
 - many other government depts. do not have a culture of planning
- Preparedness Continuum: The Need for Pre-Event Planning
- National Planning Scenarios (15)
 - Nuclear detonation—Cyber attack
 - we might call VISA and BankAmerica to learn how
- Integrating State and Local Planning with Federal Planning
 - Interface with 54 states and territories
- Task Force Emergency Readiness: Organization
 - How to help Governors, National Guard
- Integrating Global & Maritime Initiatives
 - how to apply technologies to these problems—Joint Concept Technology Development
 - if a dirty bomb goes off in Long Beach, the Western US will run out of gas in four days
- Comprehensive Maritime Awareness (CMA) JCTD
 - we cannot do this alone, cooperation needed between gov'ts, militaries
- Summary
 - challenges of law enforcement collaboration with military
 - must share resources and capabilities with states and municipalities
 - where to lead vs. where to support and enable

Q & A Discussion

NYC did well in 9/11 because of what DoD did for Y2K to build relationships. This has only been done recently. Previously, it was: "Turn right and invade Grenada at 7:30am." Why did Al Qaeda kill 3000 people on 9/11? Because they couldn't kill 3,000,000.

This includes Mexico and Canada. The Netherlands wanted to help with dike pumps for Katrina but didn't know how to send them.

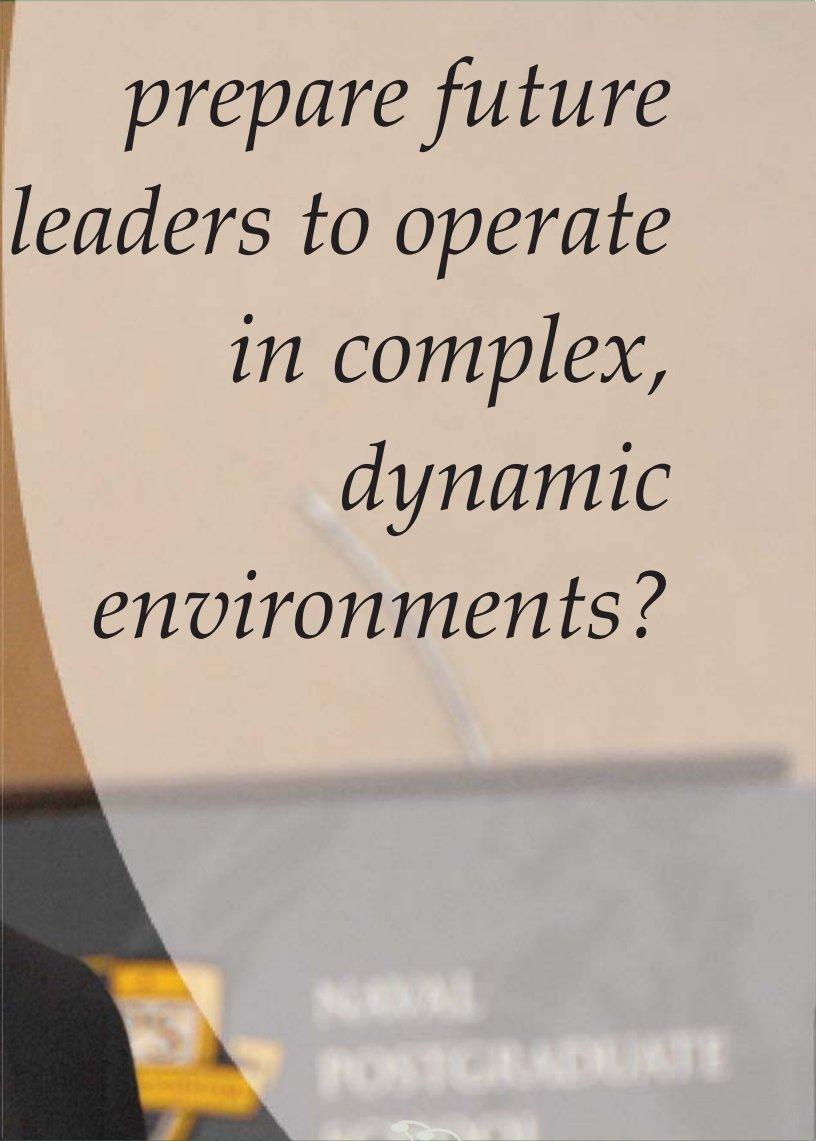
DHS works very closely with the USCG and the other services, too.

The importance of the education component. Each service is different and each state controls its own budget. We need long-term education options. The Founding Fathers created an inefficient government. We are trying to identify funding for planners to support governors. We are creating a National Security Professional Development program and bringing a consortium of Higher Education institutions together.

We don't have a lot of time to figure all this out.

Day 2: July 30

*How can we best
prepare future
leaders to operate
in complex,
dynamic
environments?*



Session: Leadership in Complex Environments

Chair: Peter Walker, Tufts University

Leadership Development for Complex Environments is a significant new challenge in light of changing constructs of security and the operational environments in which military and civilian actors work. *How can we best prepare future leaders to operate in complex dynamic environments?*

Presenters

Ned Powley, "Emotional Competence of Junior Military Officers"

Marc Ventresca, "Leadership in Complex Contexts"

Sandra Martinez, "Leadership Development and Measurement: Organization for Complexity, Adaptability and Collaboration"

Gregg Nakano, "Leadership in Complex Operating Environments."

Charles Hauss, "NGO Military Cooperation for Complex Environments"

Deborah Gibbons, "Building Optimal Networks for Coordination among Humanitarian and Governmental Organizations"

Peter Walker

- what's the practical research agenda that comes out of this?
- trying to understand leadership in this environment
- more ambiguous, less stable, faster-moving
- knee-jerk reaction is to try and control
- research is to have an iterative learning cycle
- how to help people understand including risk assessment in leadership?
- how to distribute leaders throughout the organization?
- how do we help leaders in other countries?
- need people who can understand the other person's point of view



Session Summary

- What behavioral competencies are critical for leaders facing extreme situations? By analyzing combat case studies, identified the following competencies: Self-Control, Optimism, Organizational Awareness, Awareness, Empathy, Selfless devotion and Personal Responsibility. What is the best way to train these competencies?
- How to give up traditional notions of leadership in an ambiguous environment? 9/11 World Trade Center site manager as a case study. He had very little formal authority. Can learn from research on innovation.
- How to identify leadership capabilities for complexity and adaptability? Desire to create an associated Leadership Development Profile. Would like to use an action research model to understand inter-connections of different models.
- ALLIES (Alliance Linking Leaders in Education and the Services) is a Tufts University undergraduate program designed to prepare the next generation of inter-agency leaders. This is achieved through fieldwork experience with teams made up of ROTC cadets and other students. A Joint Research Project in Jordan was extremely successful in bringing these two groups together.
- NGOs and the military must take every opportunity to work together because no one can do this work alone. Many NGOs resist working with the military. There is value in associating with people who are different from you are and leaving your ego at the door.
- How to do research on helping NGOs and governmental organizations better collaborate? Hard to measure. Aspire to create guidelines for both sides on how to work together. Field research has been an analyzing specific networks, for example, county public health.

Ned Powley, “Emotional Competence of Junior Military Officers”

- Leadership
 - extreme contexts yield insights
 - more than driving results, the human element
 - interaction with followers and context
- Research Questions
 - What are behavioral competencies are critical for leaders facing extreme situations?
 - Analysis: code leaders’ actions in the incidents (thematic coding)
- Emotional Intelligence Model
 - four quadrants
 - Self-Awareness, Social Awareness, Self-Management, Relationship Management, Cognitive
- Propositions
 - emotional self-control
 - adaptability
 - inspirational leadership
- positive outlook
- empathy
- Vignette 1
 - junior officer in confrontation with a senior
- Vignette 2
 - near heart-attack
 - commander was empathetic and personal
- Vignette 3
 - IED attack, casualties
 - awareness, empathy, adaptability
- Observed Competence
 - Self-Control
 - Optimism
 - Organizational Awareness
 - Realism
 - Vision
 - Awareness
 - Vigilance
 - Empathy

- Selfless devotion
- Personal responsibility
- A fertile area for research
- focus on individual level, people to people match that matters
- what's the best way to train these competencies?
 - can be developed and coached

Q & A Discussion

We do not have a method for selecting these attributes, and it may be illegal to ask! How then to institutionalize it?

Disasters are irrational. How to act rationally in an irrational environment? We currently do not include mentoring and coaching in this model.

We do not currently use simulation but would like to learn more. This is first-stage research.

Marc Ventresca, “Leadership Amidst Ambiguity”

- in complex, dynamic environments
- try to give up traditional notions of leadership
- this is all about improvisation that takes advantage of the situation
- Integrative thinking, Martin 2007
 - nimble-minded
 - broad-minded
 - tough-minded
- World Trade Center / Burton
 - unbuilding the Twin Towers
 - cross-sectors
 - fewer hierarchies
 - ambiguities
 - legacy sources, composition & purpose
 - assessment team
 - 4 quadrants
 - had very little formal authority, not recognized as “a leader”
 - how he interacts with a situation
- 7 types of ambiguity, Abbott 2001
 - don't study this enough
- Some research pivots: ambiguity and conditions of leadership
 - language, duration, narrative, etc.
 - use the kinds of ambiguity to inform action and research
- Lessons from recent innovation research
 - relationship to leadership
 - knowledge brokering
 - networks
 - ecologies and ecosystems, what organizes leadership
 - role of intermediaries
- Creating a Culture of Innovation

Q & A Discussion

Not currently looking at what learning environments need to be created, only extreme case studies. Today was about giving “viagra for the mind” about leadership.

Note the interplay of individual and environment in the 9/11 example: his actions helped shape the environment which shaped him.

The notion of the creation of a “safe space.” Can we create this? There is a dance of how much de-coupling leads to innovation.

Sandra Martinez, "Leadership Development and Measurement: Organization for Complexity, Adaptability and Collaboration"

- Clifford Geertz quotes
- examine cognitive frameworks and action
- Recognition of challenges in message from military and select civilian leaders
- Proposing an integrated theoretical framework for inquiry and practice
 - an emergent perspective
 - constructive development theory
 - individual and organizational learning theory
 - why recognitions of patterns is important to anticipate shocks
 - instable systems are more innovative
- Leadership capabilities for complexity and adaptability
 - sufficient cognitive complexity
 - sufficient cognitive agility
 - Worldview consistent with complexity
 - capabilities for mutual feedback and power-sharing
- Leadership capabilities for complexity and adaptability
 - ability to harness collective intelligence
 - understanding of sense-making and learning processes
 - maintain perspective from multiple temporal realities
 - act in the present, learning in real-time while understanding the history and consequences
- Leadership Development Profile (LDP)
- Action-Logics: 7 Transformations of Leadership
- Research Objectives
 - understand inter-connections of these models
- Proposal
 - use action research model, researchers and practitioners work together



Gregg Nakano, "Leadership in Complex Operating Environments"

- Civil-Military Leadership Education in Complex Operating Environments
- prepare next generation of inter-agency leaders
- evolved from black vs. white
- rest of the world is beginning to question if we are the good guys
- the domestic challenge
 - poor education
- legacy challenge
- Attitude and outlook
- today's freshmen do not know what the Cold War is at all
- it's the economy stupid: it takes time to re-tool an economy
- American Political ideals
- Declaration of Independence

- global perspective
- Four Freedoms
 - used as justification for WW II
 - Marshall Plan
- a contradiction between these written ideals and how others perceive us
- restructuring programs for these changes
- ALLIES
 - creating collaboration between cadets and other students
- Joint Research Project (JRP) in Jordan
 - between civilian and military students
 - had students get to know local people
- Challenges to Implementation
- Keys to Success
 - Personal relationships
- trying to build those personal relationships
- began to see interviewees beyond their organizations
- Unexpected Challenges and Discoveries
 - Jordan may be running out of water
- Key Take-Aways
 - trying to help them learn to interact with each other
 - will pay-off in 15–20 years
- Zero Sum of Common Zero
 - “We may disagree about everything, but at least we can sit down together and have tea.”
- Chance for Peace
- Follow-up plans

Q & A Discussion

The suggestion was made that personal relationships do not drive institutional change, that the structure of networks do matter. But there is still that element of randomness which matters.

The notion that “old guys can change.” Our elites feel comfortable without a need to change.

The students designed this program when they felt they knew nothing about the military.

This is a great example of action research. You can get research material from this. There is a plan to begin tracking these relationships in the long-term.

Charles “Chip” Hauss, “NGO/Military Cooperation for Complex Environments”

- Einstein quote
- Relationships informing interaction with complex systems
 - NGOs and State Dept. do hang out after work, not formally
- What This Means for Globalization
 - we have to work together whenever and wherever possible
 - leadership is not something either of our communities can supply alone
 - New London, CT as a metaphor
- not all NGOs will work with the military
- Thinking creatively—The Fortune Cookie Chronicles
 - a general who would choose to sit down with the person who was most different from them
 - think obliquely
- Activities
 - Informal discussions with Highlands, events like this
 - Work with politicians and academics, Meese, Jebb
 - New year’s conference
- Accomplishments
 - 2004 Defense Study Board
 - Interaction, Office of the Secretary of Defense (OSD), U.S. Institute of Peace (USIP) protocol

Q & A Discussion

What it means to be a leader. We don't determine who our leaders are. We just gather people. "I'm Jewish; I'm a pacifist. I find it more fun to hang out with people who are different from me."

The importance of war termination; we need "the fourth block." The NGO community can help the military with this.

The importance of the cross-sector piece. What are the learning advantages of forced cross-sectoring? We've never tried forcing this on anyone. There are times when NGOs and the military can't work together well, for example, Iraq.

This is the antithesis of command and control, if you respect people.

The relationship between NGOs and the military can evolve through better training. You find those neutral spaces in which to do this.

The importance of leaving the ego at the door. It's helpful to have people who don't need to prove anything, perhaps who are older, who have had traumatic experiences, who have naturally brought things together.

Deborah Gibbons, "Building Optimal Networks for Coordination among Humanitarian and Governmental Organizations"

- a little bit macro
- the assessment and enhancement of networks
- Why do we care about such coordination?
 - health and human services
 - crises in other countries
 - structure of networks still not researched very much
 - have just enough investment in partnerships
- Research Challenges
 - hard to measure
 - big, complex, emergent
 - dynamic
- Addressing these Challenges
 - document
 - replicable procedures
 - computational simulations
- Applications
 - generate guidelines for humanitarian and government organizations
 - need government money to facilitate what NGOs are doing
- Field Research: Analysis of Specific Networks
- Example: County Level Public Health Network
- Computational Modeling: Virtual Experiments and Network Prototypes
- Example: Provincial Reconstruction Teams
 - reduction in number of partners
 - can identify optimal zones
 - cost vs. benefits
- Referral Network and Decision Effects on Administration of Scarce Resources
- Benefits of Integrating Field Research with Network
- Field Research Priorities

Summary of Q & A Discussion

This is empirically study-able.

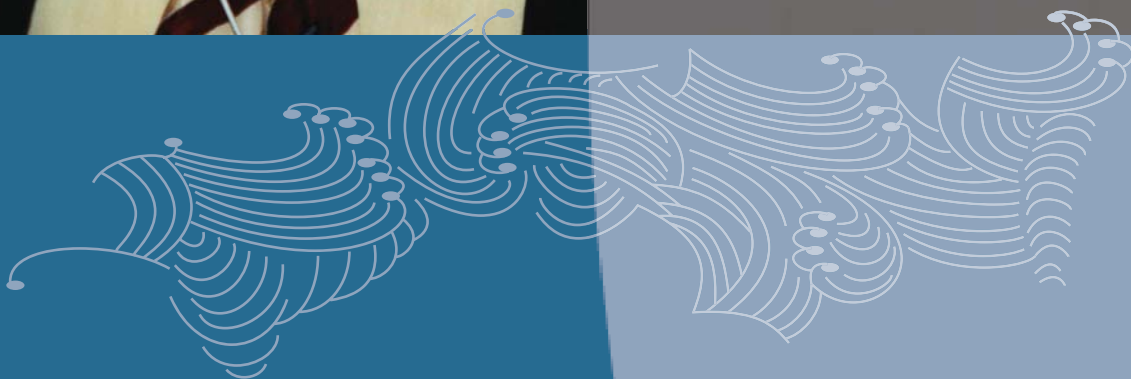
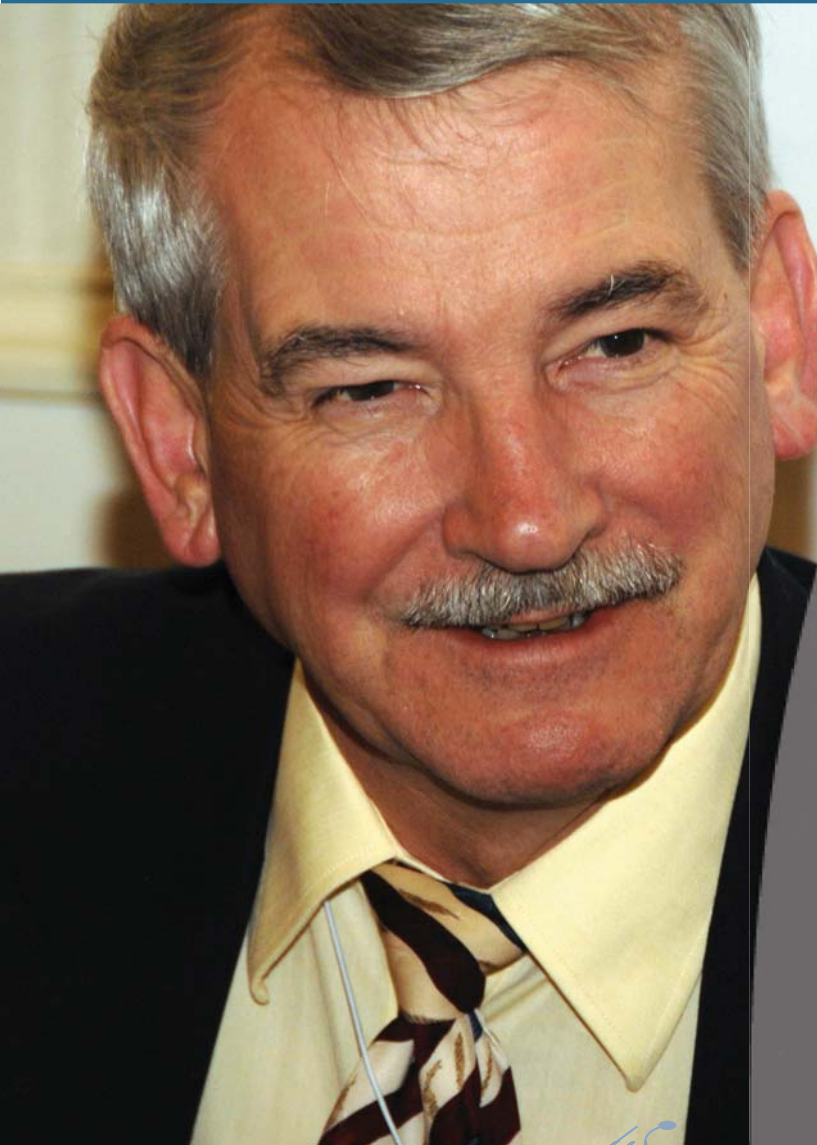
There are strategies for making short-cuts to make field research easier.

To address site security, we can get a representative sample in secure sites. What kinds of ties do they have? We can compute the probability that two clans might talk to each other.



Day 2: July 30

*Focus on
“traditional”
conventional
threats... is
giving way
to greater
attention to
non-traditional
threats.*



Session: Global Maritime Partnership

Global Maritime Partnerships represent a new approach to maritime security. Focus on "traditional" conventional threats, previously the primary province of individual nation state responses, is giving way to greater attention to non-traditional threats better handled by ad hoc coalitions and partnership relationships.

*Chair: Mitch Brown, US Naval War College,
Monterey Campus*

Speakers

Lawrence de Bivort, "The Mind of a Terrorist"

Arabinda ACHARYA, "Asymmetric Threats to Good Order at Sea"

Chris Vogt, "Maritime Security Challenges Learned in Current Efforts"

Paul Mitchell, "Maritime Domain Awareness and Cooperation in Digital Environments"

Lee Cordner, "Oceans and Maritime Policy Implications of a Changing World"

Alex Bordetsky & Arden Dougan, "Networking and Collaboration on Maritime-sourced Nuclear Threats"

Charles Kimzey, "PACOM & Maritime Partnerships"

Session Summary

- Terrorists see themselves as freedom fighters vs. oppressors and want to tell their story. Organizing as small groups allows them to learn quickly. The military option should be the last choice, given its propensity to aggravate popular motivation.
- Terrorists in small fast boats can be very effective asymmetric non-state actors. They are becoming more organized. Are we putting resources in the wrong places?
- Joint Capability Technology Demonstration (JCTD) Program. How to leverage information sharing and integrating technologies while building relationships with other nations to do so, particularly poorer nations?
- How to wage Network-Centric Warfare: a 1000-ship Navy from a coalition of nations, fully netted and interoperable, ready at a moment's notice. Such a force would wage peace and good, not just war.
- Social Networks enable digital ones. The most serious challenges will come from the policy arena, not the technical one.
- Australian National Centre for Ocean Resources and Security (ANCORS) focuses on legal, policy, security and development focus. 99.9% of Australia's trade is by sea. The impacts of climate change will be substantial on Australia in part due to the migration of island populations.
- For nuclear threats, desire to create real-time situation awareness and collaboration including tagging, tracking and locating vehicles. Portable radiation detection is possible in real-time.
- PACOM's theater strategy covers 51% of Earth's surface, 60% of Earth's population. Must plan with 39 nations, a system of systems. Employing various technologies to build Maritime Domain Awareness, including WMD detection capability. Singapore has been a great R&D partner.

Lawrence de Bivort, “The Mind of a Terrorist” — Terrorist Cognition and Organization — Counter-terror Implications

- Researched why terrorists behave the way they do
- Archived materials were inadequate
- Research conducted where terrorists reside
- Cognitive characteristics
- Terrorists see themselves as freedom fighters vs. oppressors and want to tell their story
- They believe negotiation is an option
- They believe they have a high probability of success
- Strength emerges from defeat to disrupt oppressor activities
- Organization weaknesses balanced/negated by strengths
- Rapid evolutionary selection against weaknesses—increasingly competent
- Terrorist group learns from counter-terrorist group and vice versa = co-evolution
- Suggests terrorist are learning faster than counter-terrorist entities because they are smaller groups
- Terrorist is one step from megalomaniac
- Implement Preventive Cognitive Intervention (PCI) and Strategic Systems Intervention (SSI) measures
- Hardening targets is necessary but not sufficient
- They define oppression differently—political, economic, ethnically based, religion, or a variety of things
- Military option is last choice, given its propensity to aggravate popular motivation against counterterrorism forces

Arabinda ACHARYA, “Asymmetric Threats to Good Order at Sea”

- 1939 Einstein predicted that uranium could be used as a nuclear bomb
- Good Order at Sea vs. Threats
- Low-intensity maritime operations capabilities of asymmetric non-state actors—use of small fast boats
- Disproportionate impact on traditional pillars of maritime security
- Determinants of asymmetric conflicts at sea
 - Actor-target synergy
 - Convergence effect
 - Technology-tactic proliferation effect
- Piracy and Terrorism—more organized today
- Light aircraft can conduct suicide missions against maritime targets—increases range of threat
- Future threats
 - Internet and the spread of knowledge
- Chaos in the littorals present both a promise and a peril—includes most of population centers
- All operations ‘at sea’ linked to facilities on land or events ashore
- Source of most asymmetric threat—piracy, organized crime and terrorism
- Are we putting the resources at wrong places?
- Armed forces fight at sea in order to win on land
- Degrade the land capabilities of the asymmetric actors
- MDA includes blue, green and brown waters—emphasis on blue water situation; littorals is green/brown
- False boundaries compromise C-T efforts
- Vice CNO coordinating with Coast Guard more closely

Chris Vogt, “Maritime Security Challenges Learned in Current Efforts”

- Guiding Principles
 - Build maritime awareness as far from our shores as possible
 - Maritime security is an interagency concern
- Joint Capability Technology Demonstration (JCTD) Program
 - COCOMs and Int’l partners are customers
 - \$10–50 million projects, can be larger or smaller—has to be mature technology
- Regional Maritime Awareness Capability (RMAC)—start with virtually nothing to build maritime forces
- Use government systems/software installed, training also provided
- Sao Tome and Principe / Nigeria strong commitments
- AIS integrated with radar/optics data—single common, sharable data
- Serious gaps exist in identifying and prioritizing worldwide maritime threats
 - Addressed by Comprehensive Maritime Awareness JCTD
- Sharing information crucial to success
- Multi-level enclaves provide appropriate level data to customers
- Hundreds of unclassified sources mined for data, classified as appropriate for dissemination
- Relationships analyzed
- Cargo associated with businesses tracked
- Scenario takes a trained analyst no more than 5 minutes to process info request
- Challenges—policy, operational and technical
- Sustaining of capabilities an issue with poorer countries

Paul Mitchell, “Maritime Domain Awareness and Cooperation in Digital Environments”

- Case of Canada & Australia in the Gulf 2002–03
- Most serious challenges will come from the policy arena, not the technical one
- Networks and coalitions
- Network-Centric Warfare—Coalition operations in the age of US military primacy—book
- Geology, Politics and History remain relevant in technological society
- 1000 Ship Navy—coalition of nations, fully netted and interoperable, ready at a moment’s notice, a force to wage peace and good, not just a force to wage war
- US Navy Strategic Plan
- USCG Maritime Domain Awareness
- Australia and Canada blockades discussed—entire Navy involved, all but a couple ships
- Area of Operations complex, challenging—testimony to impact of IT to manage differences between allies
- Human-based protocols often have to be re-brokered
- Positive indications—effective cooperation, integration permitted greater coalition interoperability, Gateway C4ISR
- Negative indications—trust built through frequent operations, significant impediments to integration remain (proliferation of networks), increased concern for infosec—the bar will be high
- Social Networks enable digital ones—Band of Brothers an example—strategic and operational trust
- Tension—military environment at odds with the political environment; digital protocols cannot accommodate human element
- Conflicting concepts
- Control vs. Compromise balanced by nature of Trust by partners
- Interoperability determined by policy (if possible)—network centric warfare may be compromised
- Coalition nations still have restricted ability to communicate securely

Lee Cordner, “Oceans and Maritime Policy Implications of a Changing World”

- Australian National Centre for Ocean Resources and Security (ANCORS)
- See workshop document for background info (p. 65)
- 10+% of world trade from Australia
- 99.9% of trade by sea
- Oceans Law & Governance, Maritime Strategy & Security, Marine Resources, Industry & Environment overlap
- Research has a strong legal, policy, security and development focus
- Climate Change issues have substantial impact on Australia
- Marine protected areas proliferating, affected by climate change
- Effects of climate change on shipping routes in the Asia Pacific? Security? Boundary delimitation/baselines?
- Massive transmigration from one country to another predicted due to climate change

Alex Bordetsky & Arden Dougan, “Networking and Collaboration on Maritime-sourced Nuclear Threats”

- NPS-LLNL MIO Cooperation among many agencies, entities, countries
- Biometrics for monitoring
- Vehicle tracking across countries
- Goals
 - Real time situation awareness and collaboration
 - Tagging, tracking and locating a vehicle
- Radiation detector portable detection in real time—data relayed back to LLNL to determine what it was (naturally occurring radioactive material in exercise)
- Interdiction and Search Phase goal to explore feasibility and major constraints associated with collaboration, data sharing between boarding parties engaged, and the ability of command centers to come up with the scale of threat imposed by multiple small craft threat penetrating a metropolitan area in open waters using radiation detection and biometrics
- Produced good results on different command and expert sites collaboration



Charles Kimzey, “PACOM & Maritime Partnerships”

- Maritime Domain Awareness; A Pacific Perspective
- Defense R&D proves operational efficiency/effectiveness
- Talk to COCOMs (customer) about product development
- Maritime domain awareness issues not resolved, progress being made, a long way to go
- R&D activities needed to combat threats effectively
- Maritime awareness small part of the problem
- Entire process of dealing with threats reviewed—system of systems issue
- PACOM Theater Strategy
- PACOM’s Neighborhood—51% of Earth’s surface, 60% of Earth’s population
- Plans in place with all 39 nations in region
- AOR Priorities—building relationships, how to work together to achieve peace and stability in region
- Challenges
 - Many targets as possible threats (in the millions)
- AIS system—300 gross tons and larger tracked
- What is on the ships and the people that define the problem
- International/Interagency Information Sharing—people, cargo, intent, location(s), etc
- Maritime Domain Awareness capability spiral 1 prototype goals
- Singapore great partner in Research & Development (R&D)—Unmanned Surface Vehicle (USV) Spartan 7m, ROSAM Launcher, 2 SPIKE light missiles, .50 caliber
- WMD Detection Demonstration
 - Standoff detection capability on an unmanned platform that will detect the presence of either gamma ray or neutron radiation
 - Upon detection, conduct closer investigation to characterize radiation



Day 2: July 30



*The goal is
to formulate
research
questions
of interest
synthesizing
new technology,
policy challenges,
and partnership
opportunities.*



Plenary

Session: Synthesizing Inputs from both Tracks into Research Ideas

Main Research Ideas from Maritime Security Track

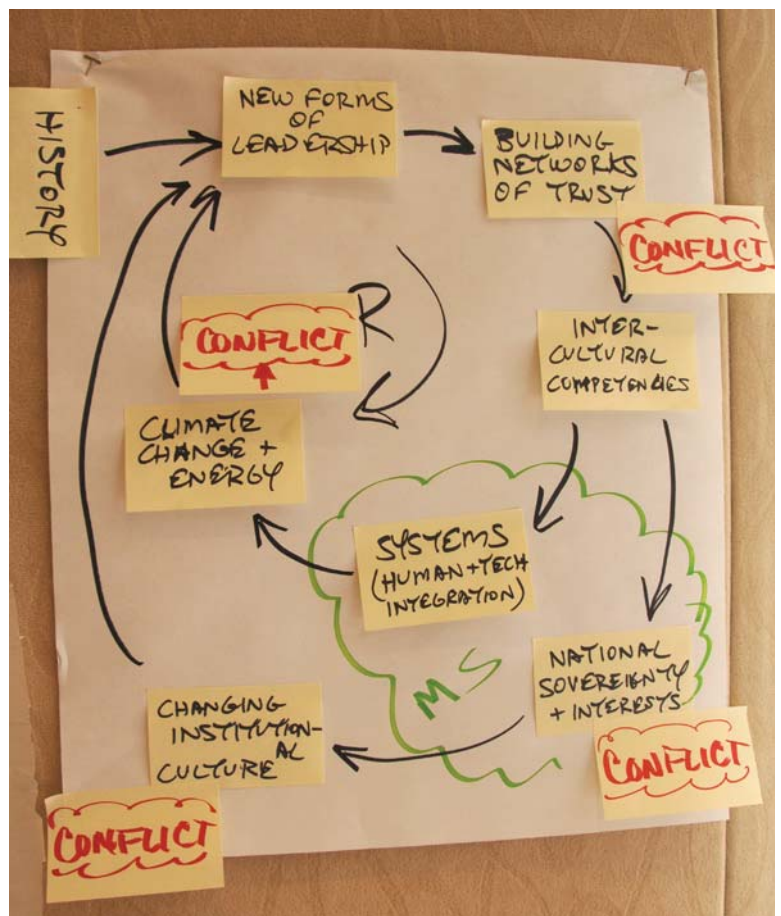
Chairs: Tom Huynh, Don Brutzman, NPS

Summary

- Many technical opportunities available in Maritime Security for further development
- Many policy-related opportunities and challenges that might add relevance for new technology
- Partnership NPS-Singapore-LLNL offered as basis for further research programs
- Goal: formulate research questions of interest

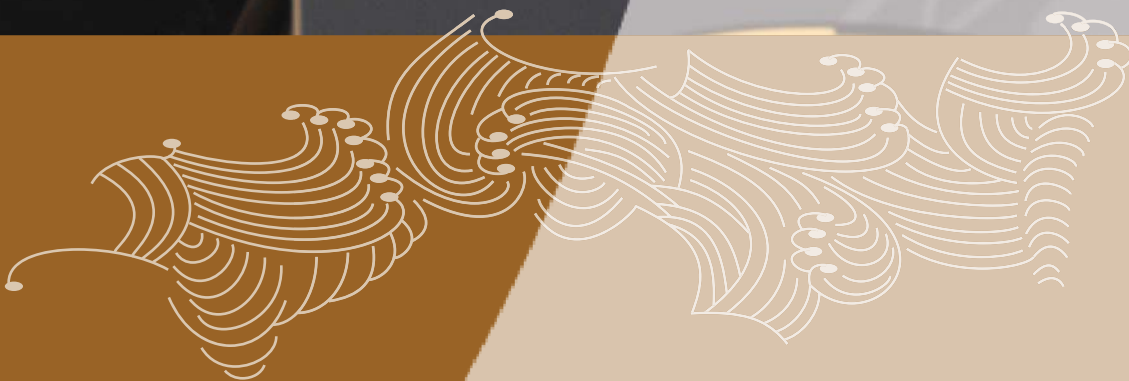
Key Points

- Systems Diagram by Jean Tully
- a plea to remember history
- cluster Systems + National Sovereignty & Interests



Day 3: July 31

*What's needed
is to think
about the
ocean as a
global system
of systems,
not just as
transportation.*



Plenary

Speakers: Leonard Ferrari, YEO Tat Soon, Karen Guttieri

Leonard Ferrari

- globalization requires better economic models
- who pays for clean-up?
 - don't have complete economic policy
 - role of revenue flows, global finance
- roles of agencies vs. individuals
- what kind of needs do we have
 - faculty, student needs
 - cost for travel
- be creative in finding funding for research, student support
- Maritime Security research issues
 - where does support come from?
 - what kind of research? Operational
 - port security
 - surveillance
 - ship as a weapon
 - laws of the sea, policy issue
 - Are we trying to solve problems or educate people to solve problems?
 - Must we change the education model?
- You can work these two areas separately or think about maritime security as the entire system, not just ships on the surface
 - sea life, temperature, climate issues
 - thinking about it just in terms of shipping containers is too narrow
 - not just transportation
 - in this way, it is related to globalization
- Need better processes for such inter-disciplinary research, support
- both Singapore and U.S. are interested in these problems
 - better proposals demonstrate that both are interested in a topic
- challenge is to figure out how to bring all these organizations together to do this work
- education can be easier than convincing the government that we can solve these problems
- who wants to work on what project, is it education, research?
- next meeting of this group will be in Singapore next year

YEO Tat Soon

- some “sales talk” to persuade decision makers of importance of topics
- key words: culture difference, human dimensions, integrations of human dimensions, policy and technology, systems
- thinking about the ocean as a system, not just transportation
- symposium on systems engineering in Singapore next year: East Meets West, exploring human dimension of systems
- What is achievement?
 - people from so many different countries, we are doing something
 - hope we can organize more conferences
- What are we going to do next?
 - preventions, protections, post-event recovery
 - we should be able to find funding for such projects
 - also have policy people here
 - nations have different interests, and inter-dependent
 - needs are dynamic
 - there are no true friends or enemies
- What is the meaning of collaboration and information sharing?
- Climate change, global health, governance

Karen Guttieri

- sea level rise as an example of a systems problem
 - build a sea wall
 - how will it serve our neighbors?
 - consequences of displaced neighbors
 - treat the symptom or the cause?
- how do crises emerge?
- importance of leadership emerged as a theme in sessions
- how do we translate what we've done to next steps?
- focus for today on identifying top research ideas
- will present research profiles in the afternoon
- Outline of Research Profile
 - Statement of Research Question
 - Research Dream Team
 - Sponsor/Funding Sources
 - Next Steps/Processes
 - creating and edited volume
 - proposal writing
 - scenarios/exercises
 - educational needs

Plenary

Session: Lunchtime Speaker Senator Gary Hart

Summary of Gary Hart's Comments

The first wave of globalization came to the US in the 1970s. Most businessmen reacted with protectionism while simultaneously believing they would remain free to sell their own goods overseas. It has taken American businesses a long time to see trade as a two-way street. None of these issues can be solved by military means or one nation, alone. We have a lack of Statesmen and Stateswomen, people who can rise above narrow ideological and partisan constraints and see the broader view. How to encourage a new George Marshall and Dean Acheson?



Senator Gary Hart: “Reflections on the Role of Research in Policy”

- perspective discussed today started 30 years ago
- noticed ground-swell change not being discussed
- changes were multiple and profound
- our cars were not being made in Detroit, TVs, clothes, etc.
- the first reaction of commerce was negative: protectionism, tariffs
- meanwhile, advocates still seem to think they can sell their products overseas
- took them a long time to see that trade is a two-way street
 - other countries would have the same response
 - e.g. steel, autos
 - business leaders slowly began to understand this
- one failed idea: domestic content measure: 60% of any auto sold in US be made in the US
- recently, Obama and Clinton making “fairness” promises to US workers
- older generation politicians seem to be more protectionist
- younger politicians seem to understand trade as a system
- Founding Fathers urged us to stay out of the turmoil of Europe
 - worked for about 150 years
- in WW I, we began to realize that the world was shrinking
- WW II, Truman guided the US to having a world presence
- now experiencing globalization, the multi-national corporation, information sharing
 - information for sure, knowledge less so
 - efforts to suppress information—for example, about the Olympics—are doomed to fail
- C-SPAN enables the public to watch the legislatures at work
- the oceans have disappeared as strategic protection, in part because of 9/11
- the oceans are now ways to get to the US, not ways of keeping people out
- in a globalized world, we can turn what used to be a defense, into an advantage
- not all good
 - proliferation of WMDs
 - viro-pandemics, not prepared for this
 - failed states
 - climate change
- none of these can be solved by military means, alone
- none of these can be solved by any one nation, alone
- we are globalized whether we like it or not
- cannot be prevented by having a large military, or integrating armies
- we must re-think our notion of security
- think about 1945 and 1947: the line between an isolationist US and an international US
 - created a host of int’l organizations
 - have prevented WW III, to a large degree
 - can’t rely on them to solve our new problems
- what can we do to help our political leaders think as creatively as Truman, Marshall, Acheson to create a new internationalism?

Q & A Discussion

For the US Commission on National Security for the 21st Century, we recommended that a large terrorist threat was our greatest threat. We were tasked to spend 2.5 years developing recommendations for the next administration. We tried to look at opportunities as well as threats. We concluded that terrorism was a threat to the homeland and recommended the creation of a new body, the Dept. of Homeland Security. The new administration did not heed our recommendations. The current DHS is much bigger than we had proposed. Preoccupied with the biological threat because so portable. The targets are also now Denver, Dallas, and Detroit. We are not nearly as well prepared as we should be. We need to integrate special forces.

We can expend energy both in the military industrial complex as well as in international collaboration: “guns and more butter.” Military leaders urge more diplomacy. The fact that leaders know any nuclear capability

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they may be planning can be destroyed strengthens the hand against non-proliferation. Increasingly, we're all going to have to win or we'll all lose. One definition of national security is: a secure border, a sound dollar, and confidence of the people in government. None of these is currently true. We must start the transition to a post-carbon economy, change the economy from consumption to production. It's not sustainable. We are borrowing money from the Chinese and Japanese to sustain our life-style. I think we can do both.

The younger generation doesn't value lessons of the past, for example, the Cold War. The concern of how to transfer knowledge to the younger generation. I have traveled the world seeing us from other eyes. I'm now an old codger: my period was much better than the present. There were few of us that could apply lessons from the past. For Americans, every day is a new day. We are not shackled to the past, but we also need to have a memory of the past. I've known dumb 80 year-olds and smart 30 year-olds; there's not a perfect correlation. We have a lack of Statesmen and Stateswomen, people who can rise above narrow ideological and partisan constraints and see the broader view. We need to produce more math/science Ph.D.s and educators. It's not a political problem; it's a cultural problem. It would be nice if scientists learned some philosophy.

Plenary

Session: Research Program Profile Report-Outs

The following research program profiles are provided as Appendix B.

Don Brutzman and TDSI Team

Research Question: How to use modeling, simulation and visualization to illustrate and integrate all projects coherently?

- Technology capability exists to illustrate and visualize all of these complex capabilities in concert
- willing to work with multiple projects
- Utilize Web Architecture, open standards, Extensible 3D (X3D) Graphics and X3D Earth

Deborah Gibbons et al.

Research Question: How do we develop and build capacity for intercultural collaboration to address destabilizing influences, and what can you do to enhance stability?

- don't have deep cultural insights for many places of the world
- develop principles in any culture or region in a decision-support model
- different categories of crises may be relevant
 - can help human services enormously
 - disaster response
- products
 - decision support, probabilistic model
 - workshops, crash courses for collaboration
 - guidelines, the down and dirty stuff that the kids on the street need to know to build relationship on the ground

- how we might integrate this into the education process, curriculums
- intended to be integrative
- a project of projects
- iterative process between field research and building the model

Tom Huynh and Chip Hauss

Research Question: How do we identify and quantify leading indicators (LI) used in predicting and thereby helping to prevent violent conflict resulting from globalization?

- Emergent behavior: wealth asymmetry
- Emergent behavior: political and social asymmetry
- Need for approach to identify and quantify LIs and to use them to predict onset of violent conflicts
- intent to bring together a research team that doesn't normally work together

Peter Walker and Karen Guttieri

Research Question: What's the relationship between climate change and human crises and the implications for government?

- model: science part and policy part
- what causes governments to adapt or repress?
- try to do this as experiential learning, with master's students being the researchers
- State Dept. is becoming more involved in these issues

Andrew Fallon et al.

Research Question: What are the overarching policy issues, technical requirements, sensor systems, and architecture necessary to achieve Maritime Domain Awareness both internationally and domestically?

- terrorism, piracy, dumping, environmental impacts
- take about 3 years to do this
- What does maritime domain awareness (MDA) really mean? Can't be 100%
- requires models that don't exist
- where does maritime domain awareness occur?
- a true "system of systems" engineering problem
- can provide information for captains of individual vessels

Gary Langford et al.: Redesign of Counter-Terror Strategies

Research Question: How do drivers of globalization effects value structures?

- two aspects:
 - Value model for globalization
 - Drivers for risk

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- need to continuously review global landscape

Research Question: What are the aspects of counter-terrorism strategies that diminish the threats of terrorism?

- An evolving threat of terrorism necessitates a continual review of counter-terrorism strategies.

Deborah Gibbons et al.: Sub-project of Global Partnership

Research Question: What are the leadership capabilities and the tools to develop these capabilities at individual, team, organizational and societal levels that are needed to support intercultural collaboration? What are the interrelationships among leadership, organizational resilience, and institutional and societal adaptability?

- Leadership is key driver for team, organizational, institutional and societal adaptability and change.



Appendix A: Workshop Schedule

Day 1: JULY 29 Tuesday

Framing Challenges of Globalization and Maritime Security

7:30	REGISTRATION	
8:30	Workshop Opening Leonard Ferrari, Provost NPS & Karen Guttieri, NPS	
9:00	Globalization and Maritime Security: US Maritime Strategy focuses on building relationship and preventing wars. What is the future for Maritime Security in the context of globalization? What trends are most significant? What is the new kind of work emerging with political, economic and social developments? What are the critical relationships with partner countries to ensure global and maritime security?	
	Admiral Patrick Walsh, VCNO Brigadier General TAN Yih San, Future Systems Architect, Singapore	
11:00	Roundtable: Research Program Design for Complex Challenges Panel Discussion Moderator: Dan Boger, Dean of Research NPS Starnes Walker, Director of Research DHS YEOH Lean Weng, Deputy Director of Temasek Defense Systems Institute	
12:15	LUNCH: Speaker: DASD Greg Gross “DoD and Future of Security”	
1:30	Maritime Security Track Straits of Malacca & Singapore: Port Security I The Port Security project is to assess advanced technology for port security by assessing the effectiveness of advanced sensors and defensive technology, integrated with existing assets to create higher levels of security. Methodologies will be developed and analyses performed for assessing port security threat levels, risk assessments, organizational roles, and investment strategies for improving port security. Chairs: Tom Huynh and Don Brutzman, NPS Presenters: John Hiles, “MAST Prototype and Digital Swarming: CHUNG Wai Kong, “Maritime Security Issues” Gary Langford, “Maritime Interdictions in a Logistically Barren Environment” LIM Horng Leong, “Persistence Surveillance” Ken Davidson and Tom Huynh, “Field Tests of Coastal Surveillance System of Systems” Michael Matson, “Maritime Security Patrol Craft: System of Systems Approach”	Globalization Track Globalization systems The Globalization Systems project is about mapping systems such as food security or energy so that we’re not simply reacting to the consequences of globalization but identifying the causal linkages. In an informal survey, a lot of interest was expressed around the topics of climate change effects, poverty and governance issues. Chair: Leonard Ferrari, NPS Presenters: Sujoyini MANDAL, “Globalization of Violence: Terrorism and the War on Terror” Justin Locke, “Climate Change-Induced Migration in the Pacific Region” Alvin CHEW, “From Energy Security to Social Security” Alexandre Hedjazi, “The New Canon of Security in Central Asia and the Caucasus” David Smarsh, “Assessing National Security Impacts from Global Climate Change—A Survey” TAN Yeling, “Asia and Globalization”

Day 1: JULY 29 Tuesday

Framing Challenges of Globalization and Maritime Security (continued)

4:00	<p>Straits of Malacca & Singapore: Port Security II</p> <p>Security for the Straits of Malacca and Singapore project will assess the effectiveness of a system of systems, which include multi-national land-based, surface, underwater, airborne, and space-based platforms, sensors, C4I centers, weather centers, shipping companies, and international and private maritime information organizations.</p> <p>Chairs: Tom Huynh and Don Brutzman, NPS</p> <p>Presenters:</p> <p>Gabriel Elkhaim, “Multi- Vehicle Patrol and Force Protection’</p> <p>KHOO Boo Cheong, “Real-time optimization for the prediction of free surface shape water barrier: Remote acoustic-underwater bubble dynamics”</p> <p>LIM Leong Chew, “Compact Broadband Underwater Projectors for Littoral Water Applications”</p> <p>Gary Horne, “Maritime Security Applications for Data Farming”</p> <p>Gary Langford, “Value Systems Engineering Applied to the Terrorist Enterprise”</p> <p>Don Brutzman, “Web-based Modeling, Simulation and Visualization for Maritime Security”</p>	<p>Trends, Shocks, and Prevention</p> <p>The Trends, Shocks, and Prevention category show-cases leading research on shocks and trends, some of the work we’ve been doing on metrics for stability, and work by the Swiss and the US State Department prevention unit. What are the major systems involved in our priorities for research with respect to trends and shocks that will shape the security agenda? What are the implications for a prevention agenda?</p> <p>Chair: Lin Wells, NDU</p> <p>Presenters:</p> <p>Nicklaus Eggenberger, “Anomie as Predictor”</p> <p>Mike Pryce, “Mass Atrocity Response Operations”</p> <p>Scott Tousley, “Complex Security Assessment</p> <p>Igor Linkov, “Risk Management Tools for Port Security, Critical Infrastructure, and Sustainability”</p> <p>Dan Nolan, “ Energy for the Long War”</p> <p>Dan Plesch, “New Challenges, Forgotten Wisdoms: lessons from America’s creation of the United Nations to beat Hitler and secure the peace”</p>
6:30	<p>Reception: MC—President Dan Oliver</p> <p>VADM USN (Ret.) NPS Speaker: DASD John Kabricky</p>	

Day 2: JULY 30 Wednesday

Prevention and Partnership: A New Agenda

8:45	Case Studies on Prevention & Partnership <p>The US Department of State is among those agencies keenly interested in conflict prevention. Partnerships are vital to this goal. Programs designed to build resilience to multifaceted security challenges emphasize building partner capacity. US AFRICOM represents a new organizational combatant command structure in order to better address the challenges of prevention. The National Office for Global Maritime Situational Awareness is another innovative civil-military structure to improve maritime domain awareness.</p> <p>Moderator: Frank Barrett, NPS</p> <p>Cynthia Irmer, Department of State Coordinator for Reconstruction and Stabilization—Prevention Rear Admiral Lee Metcalf, Global Maritime Situational Awareness Major General Herbert Altshuler USA, Director of Strategy, Plans and Programs for US Africa Command</p>	
12:00	LUNCH: DASD Don Loren, "Homeland Security Integration"	
1:30	Maritime Security Track Global Maritime Partnership <p>Global Maritime Partnerships represent a new approach to maritime security. Focus on "traditional" conventional threats, previously the primary province of individual nation state responses, is giving way to greater attention to non-traditional threats better handled by ad hoc coalitions and partnership relationships.</p> <p>Chair: Mitch Brown, US Naval War College, Monterey Campus</p> <p>Presenters:</p> <p>Lawry de Bivort, "The Mind of a Terrorist" Arabinda ACHARYA, "Asymmetric Threats to Good Order at Sea" Chris Vogt, "Maritime Security Challenges Learned in Current Efforts" Paul Mitchell, "Maritime Domain Awareness and Cooperation in Digital Environments" Lee Cordner, "Oceans and Maritime Policy Implications of a Changing World" Alex Bordetsky & Arden Dougan, "Networking and Collaboration on Maritime-sourced Nuclear Threats" Charles Kimzey, "PACOM & Maritime Partnerships"</p>	Globalization Track Leadership in Complex Environments <p>Leadership Development for Complex Environments is a significant new challenge in light of changing constructs of security and the operational environments in which military and civilian actors work. How can we best prepare future leaders to operate in complex dynamic environments?</p> <p>Chair: Peter Walker, Tufts University</p> <p>Presenters:</p> <p>Ned Powley, "Emotional competence of Junior Military Officers" Marc Ventresca, "Leadership in Complex Contexts" Sandra Martinez, "Leadership Development and Measurement: Organization for Complexity, Adaptability and Collaboration" Gregg Nakano, "Leadership in Complex Operating Environments" Charles Hauss, "NGO Military Cooperation for Complex Environments" Deborah Gibbons, "Building optimal networks for coordination among humanitarian and governmental organizations"</p>
4:00	Synthesizing Inputs into Research Ideas <p>Facilitators: Tom Huynh and Don Brutzman, NPS Mitch Brown, NWC</p>	Synthesizing Inputs into Research Ideas <p>Facilitators: Frank Barrett, NPS, and Peter Walker, Tufts University</p>
5:30	Plenary: Review of Research Program Ideas from both Tracks	

Day 3: JULY 31 Thursday

Writing the Research Agenda

8:30	Welcome: Karen Guttieri, NPS
8:45	Converging on Research Opportunities Going Forward Leonard Ferrari, Provost NPS YEO Tat Soon, Director of Temasek Defense Systems Institute, Singapore Define focused research programs by considering the inputs and exchanges of the 2 previous days.
9:00	Create Research Program Profiles for identified programs Working in small groups, focused on identified programs; create Research Program Profile for outbrief
10:00	Research Profiles & Processes
12:15	LUNCH: Senator Gary Hart, “Reflections on the Role of Research in Policy”
1:00	Research Profiles & Processes (con’t)
2:00	Outbriefs of Research Program Sponsorship Opportunities Go-forward Strategic Plans
4:00	CONCLUDING REMARKS—President Dan Oliver, VADM USN (Ret.) NPS

Appendix B: Research Program Profiles

The following research program profiles were collaboratively constructed by workshop participants in brainstorming sessions responding to workshop themes and discussions. Each presents the structured outline of feasible, fundable, and executable research work that can meet the needs identified in these critical subject areas.

Our hope is that actual research programs might adapt or adopt these cross-disciplinary partnership challenges to tackle the many challenges explored in this workshop. Queries and further followups by candidate sponsors are welcome.

Research Program Profile

Workshop Team: Don Brutzman & TDSI Team,
Singapore

Research Question	How to use modeling, simulation and visualization to illustrate and integrate all projects coherently.
Supporting Rationale	Use real world earth as virtual backdrop for X3D Earth and online virtual environment. Wrap inputs/ outputs for each respective model. Compare implications of each.
Time Horizon	Ongoing. 3 month milestones for each project
Research Dream Team	NPS and TDSI are primary contributors. Any research product from these workshops might be included.
Processes	Multiple exemplars already exist, this work is feasible
Creating an Edited Volume:	<p>A) Contribute 2 Chapters—One technical underpinnings; One integration techniques.</p> <p>B) Offer corresponding publication venues. Example-Wiki version of volume 4 dialogue. Example—Individual & merged 3D visualization; show complementary/contradictory? Show metrics and possible range of outcomes.</p>
Scenarios/ Exercises to test	<p>Operations in Straits of Malacca</p> <p>Operations in Port of Singapore</p> <p>Superimpose any/every other project</p>
Defining educational needs	<ul style="list-style-type: none"> • Learning Objectives: <ul style="list-style-type: none"> – How to understand each area-lesson plan • Program development: <ul style="list-style-type: none"> – Individual and shared visualization – Exposure via war game (Peace game) team exploration • Program delivery <ul style="list-style-type: none"> – World wide web access – Course/curriculum support – Workshops

Research Program Profile

Workshop Team: Deborah Gibbons, Sandra Martinez

Research Question	How do we develop and build capacity for intercultural collaboration to address destabilizing influences, and what can you do to enhance stability?
Supporting Rationale	Global partnerships are needed to reduce potential grievances and prevent war by supporting reconstruction, stabilization, and capacity for crisis response. Capacities would be supported through leadership development and assessment, trust relationship building exercises, network and system dynamics, interagency collaboration, and cultural understanding. Modeling of the leadership components would be developed in order to provide tools for leadership decision support and feedback. Simulations for specific scenarios would be produced to support various scenarios such as maritime security, infrastructure protection, natural disaster response, and environmental and climate change developments. The modeling and simulation would provide options for iterative enhancements of possible decision-making processes by the global entities preventing and responding to scenarios.
Time Horizon	Ongoing; three month milestones
Research Dream Team	Deborah Gibbons, Gary Horne, Sandra Martinez, Mike Matson, Ned Powley, Gregg Nakona, Tan Yeling
Processes	Proposal-writing: first priorities
Scenarios/ Exercises to test	<p>Modeling/simulation/data farming of Malacca Straits/Singapore port scenarios</p> <p>Variation of various infrastructure protection resources, disaster relief procedures, and environmental/ climate change policy applications</p> <p>Reconstruction scenarios</p> <p>Development of sustainable health and human service networks</p> <p>Action research project (research & educational objectives)</p> <p>Field research</p>
Defining educational needs	<ul style="list-style-type: none"> Learning Objectives <ul style="list-style-type: none"> Enable leaders to support development of mind-sets & skills for effective decision-making in complex environments.
Program delivery	<ul style="list-style-type: none"> Workshops Guidelines for building partnerships Decision support system

Research Program Profile

Workshop Team: Tom Huynh and Chip Hauss

Research Question	How do we identify and quantify leading indicators (LI) used in predicting and thereby helping to prevent violent conflict resulting from globalization?
Supporting Rationale	<ul style="list-style-type: none"> Emergent behavior: Wealth asymmetry <ul style="list-style-type: none"> Polarization between wealth and poverty Increasing income inequality between and within nations Emergent behavior: Political and social asymmetry <ul style="list-style-type: none"> Ethnicity Access to political power Need for approaches to identify and quantify LIs and to use them to predict onset of violent conflicts
Time Horizon	Initial 9-month study
Research Dream Team	NPS, Alliance for Peace Building, Policy Planning Office (SCRS), Office of Global Affairs (CIA), Consortium for Complex Operations (CCO), and Fund for Peace
Processes	
Creating an Edited Volume	<ul style="list-style-type: none"> Initiation (via conference) followed by coordination In 6 months, generate an agenda for a comprehensive effort
Scenarios/ Exercises to test	<ul style="list-style-type: none"> Apply “mission design reference” methodology
Defining educational needs	<ul style="list-style-type: none"> Learning Objectives <ul style="list-style-type: none"> Use of LIs Applications to different scenarios Program development <ul style="list-style-type: none"> Model development Data collection LI identification and quantification Applications Program delivery <ul style="list-style-type: none"> LIs Applications results

Research Program Profile

Workshop Team: Peter Walker, Justin Locke, David Smarsh, Karen Guttieri, Dan Plesch, Mitch Brown, and Alvin Chew

Research Question	What is the relationship between climate change and human crises and the implications for governmental and societal responses?
Supporting Rationale	History suggests that rapid climate change can be a tension multiplier. Current science indicates, the earth is in such a period of rapid change. As a research community, we have a role in informing governments and populations options and choices in reacting to this change. This program seeks to provide a scientific basis for these discussions.
Time Horizon	3-5 year program
Research Dream Team	Climatologists, social economists, statistician, modeling, geographer, political scientists, demographer, oceanographer, administrator (communicator), strategic and policy analyst
Processes	
Scenarios/ Exercises to test	Testing policy implications
Defining educational needs	<ul style="list-style-type: none">• Learning Objectives<ul style="list-style-type: none">– Experiential learning– Colloquia• Program development<ul style="list-style-type: none">– Global Seminar– Web-based community-participation• Program delivery<ul style="list-style-type: none">– Graduate Directed Study

Research Program Profile

Workshop Team: A. Fallon, Lee Cordner, Joshua Ho, Mitch Brown, Don Brutzman

Research Question	What are the overarching policy issues, technical requirements, sensor systems, and architecture necessary to achieve Maritime Domain Awareness both internationally and domestically?
Supporting Rationale	There is a need expressed in multiple regimes and forums (e.g. US Maritime Strategy, IMO) to achieve an overarching awareness of the maritime domain to support maritime safety, environmental protection, search and rescue and to counter piracy, terrorism, illegal smuggling. Many of the current systems being proposed to support this awareness may not achieve the desired results because they were developed and deployed for other purposes. There has not been a requisite set of studies of the overarching top-level requirements, and associated parameters, to achieve the desired levels of global Maritime Domain Awareness both in the littoral as well as on the high sea. This set of studies is crucial to developing and integrating the sensor and command and control that will meet the requirements under the required environmental conditions.
Time Horizon	3 years
Research Dream Team	<ul style="list-style-type: none"> • USN Office of GMSA • DNI Office of Global Maritime Intelligence Integration • USCG R&D Center • DoT Volpe Center • International Maritime Organization • DoS
Processes	
Creating an Edited Volume	System engineering trade-off studies; engineering notebook containing whitepapers and analysis; exercise and war-game analysis and assessments
Scenarios/ Exercises to test	Modeling and Simulation and war games and exercises will be essential in performing the analysis and understanding the relationships. Identification and development of critical models to represent and examine critical processes, environments, subsystems and systems will be worked with the M&S group.
Defining educational needs	<ul style="list-style-type: none"> • Learning Objectives <ul style="list-style-type: none"> – System of system engineering – Sensor performance and analysis – Domestic and international agency integration – Analysis of impact to international regulatory regimes • Program development <ul style="list-style-type: none"> – TBD • Program delivery <ul style="list-style-type: none"> – TBD

Research Program Profile

Workshop Team: Gary Langford, Maria Pineda, Sujoyini Mandal

Research Question	What are the aspects of counter-terrorism strategies that diminish the threats of terrorism?
Supporting Rationale	An evolving threat of terrorism necessitates a continual review of counter- terrorism strategies.
Time Horizon	Nine month study
Research Dream Team	Cultural anthropologist; system thinker; political analyst; legal analyst; psychologist; modeling and simulation specialist
Processes	
Creating an Edited Volume	Specialized section writing; integrative section drafting; then conference and workshop to complete the group think and edited volume.
Scenarios/ Exercises to test	<ul style="list-style-type: none">• profiling• preventative measures• Attributes and measures of diminishment

Research Program Profile: Sub-project of Global Partnership

Workshop Team: Deborah Gibbons, Ned Powley, Don Brutzman, Sandra Martinez, Alexandre Hadjazi, Mike Matson, Yeling Tan, Gary Horne, Gregg Nakano

Research Question	What are the leadership capabilities and the tools to develop these capabilities at individual, team, organizational and societal levels that are needed to support intercultural collaboration? What are the interrelationships among leadership, organizational resilience, and institutional and societal adaptability?
Supporting Rationale	Leadership is key driver for team, organizational, institutional and societal adaptability and change. This project leverages work in related projects: drivers and obstacles to institutional change, and modeling / simulation / visualization.
Time Horizon	2 years total, workshop exercises at 6 month intervals in combination with other research projects
Research Dream Team	Sandra Martinez, Alexandre Hadjazi, Don Brutzman
Processes	
Creating an Edited Volume	Paper describing goals, methodology, initial design, progress, results, assessment, next steps
Scenarios/ Exercises to test	Input variables and values into modeling + simulation project to develop a decision-support tool, enabling team to iteratively observe its effectiveness as a tool for arriving at better-informed and more-effective leadership decisions
Defining educational needs	<ul style="list-style-type: none"> • Learning Objectives <ul style="list-style-type: none"> – Better define, understand and document interrelationships among micro + macro factors affecting practitioners • Program delivery <ul style="list-style-type: none"> – Insert the Leadership Development Profile into the curriculum (e.g. Sage or Maritime Security) for measurement and development for students in an action-research context (students as both researchers and study participants) – Following successful prototype exercises, offer workshops for supporting leadership decisions in theater

Appendix C: Research Questions

Plenary, Day 2

Top Research Questions

Summary: These research questions cover diverse aspects of Maritime Security and Globalization. Themes include: exploring systemic approaches to Maritime Security, technological approaches, grappling with the diffusion of control in a globalized environment, and how best to measure and detect “weak signals” of latent conflict.

Maritime Security Topics

- What is Maritime Security in the context of globalization and non-state actors?
- How do we develop a comprehensive maritime awareness system capable of collecting mass data but also detecting anomalies?
- What do we do to secure the maritime domain?
- How do we establish a data-sharing platform in a global maritime collaborative environment?
- How do we improve the global vessel monitoring system?
- How do the domains of maritime security and conflict prevention combine with socio-economic factors and cultural understanding inherent to specific regions, countries and communities to achieve mutual benefit?

Global Governance Topics

- How to improve the utility of international institutions, global and local, in the context of globalization?
- What explains why certain relationships are successful or fail?
- How do we synchronize national interests in an inter-dependent world?
- New evolutions in international society: what is the relationship between trust, risk and social value in the information age?
- What are the effects of the new media, internet, on the perceptions on nation states’ actions and its implications on national and international security?
- How can we practice and resource diplomacy that engages directly with the people as well as governments?
- Who are the stakeholders in this process? What set of groups, agencies, universities etc. that need to participate? Who are the people around the world who would care about these results and benefit from them?
- How do we share the economic benefits of globalization among the rich and the poor?
- Who is responsible for cleaning up “the trash,” which in turn creates security problems?
- Globalization diffuses power to many actors (UN out-maneuvered today; influence of World Bank). How to resolve?
- How do we synchronize national interests in an interdependent world? How do we bring different efforts together so that our respective interests are best served? What are the new components of national power? Are they still diplomatic information, military, economic (DIME), or are there are different groupings such as Political, Military, Economic, Infrastructure, and Information (PMESII) that will help achieve understanding and collaboration?

Prevention Topics

- How do we treat incentives in preventing conflict and realizing maritime security locally and globally?
- How do you coordinate social and technological resources to prevent attacks on infrastructure?
- What tools and/or policies could be developed to recognize conflict triggers or roads to conflict?
- What social and cultural processes can we use to mitigate various categories of destabilizing influences and types of conflict?
- How do you monitor the actual ground implementation of conflict prevention strategies? Is it executable at the platoon or village level?
- What does success look like in conflict prevention? What are the indicators?
- What does effective leadership for conflict prevention look like as opposed to leadership for traditional execution?
- What types of conflict can occur and what are the drivers (sources)?
- How to know if we are investing resources in the right place against the right threat?

Methods Topics

- In a decentralized networked organization, who is responsible for deciding and doing things?
- What tools are in place to capture appropriate information, attitudes, perceptions, etc.?
- How do we develop multi-domain, multi-country information-sharing systems for Intelligence/Environment/Preparation, common standards?
 - identifying and accessing the center of expertise
 - knowledge management
- How do we do psychological preparation of the people involved in operating in a security environment?
- How do you achieve unity of effort where there is no unity of control?
- How to assess relationships (security, trust, risks, values)?
- What decision-making tools are needed for stakeholders to assess climate change?
- What tools are in place to capture appropriate information: attitudes of others, opinions, “public agenda,” etc. What are the key indicators of interest, e.g. for early warning of violence? And who does that?
- Need for shared, accessible information sharing. How can we monitor and understand different groups and areas, including those that are trying to remain isolated? What other groups would we need to engage with to gain access to that information? What information do we want to share, in turn supporting the monitoring tasks?
- What are the appropriate metrics to tell whether this larger process is working productively? In other words, can we measure whether this information sharing and evaluation is helping synchronize our national interests? How do we express metrics in ways that don’t trivialize complex relationships and mutually dependent issues as oversimplified numeric quantities.

Globalization Track, Day 2

Top Research Questions

Summary: These research questions focus on defining leadership roles and skills in a globalized world, including the effective development of organizations and their ability to collaborate across sectors.

- What unique leadership skill sets are required for today’s global and maritime environment?
- Are leaders born or made?
 - managers vs. leaders

- How do organizations effect leadership development?
- What is a leader?
- Does the environment create leaders?
- Kinetic leadership is only partial leadership
- What are the inter-cultural competencies necessary for complex environments?
- What does 'Wrong' look like?
- Individual and organizational levels: how to connect the leadership skills?
- How can we overcome resistance to organizational change? What are the mechanisms?
- How can we make transnational cooperation faster? How can we achieve shared goals/objectives of enhancing maritime security
- What kind and how do we develop leadership to drive and monitor organizational and institutional change?
- In uncertain/complex environment, we need to identify gaps between naive response and necessary response for leaders at all levels.
- How do we recognize/promote concepts of emergent leader types within the traditional hierarchical (team-oriented) organizations?
- Development of leader-member and mentoring relationships
- Is it possible for military and NGOs to collaborate via a website? Forum and blog?
- MIL has knowledge of need; NGOs have resources and capability; How can we link these without compromising either partner's security?

Maritime Security Track, Day 3

Top Research Questions

Summary: These questions explore how to improve Maritime Security through technology solutions and the challenges of improving international collaboration through data-sharing and policy development.

- Developing a program/system to enable persistent surveillance of selected ships and targets
 - Continuous information flow to decision makers
 - Territorial or high seas? Issues for each
- How to improve cyber security in shared C⁴I systems and networks?
 - Tradeoffs between security and collaboration
 - Impacts and implications
- Develop, deploy processes and capabilities to protect critical infrastructures in ports and waterways
- How to improve maritime cooperation between countries?
- Exploring maritime terrorist technologies in Asia
- What are new opportunities for non-lethal weapons and security patrol craft in maritime environment?
- What are the issues of legitimacy when performing maritime interdiction operations (MIO) on the high seas?
 - Governance, sovereignty, agreements, protocols, jurisdiction, policy, etc.
- How do we comprehensively redesign counter-terror strategies based on
 - Profiling of selected persons using indicators of behavior
 - Preventative interventions by analyzing discrete influences of behavior
 - Diminishing hostile organizational capacity?
- How do you define the tradeoff between persistent surveillance versus privacy across different cultures?
- How do you tag, monitor, and predict movement of small craft (< 300 tons)?
 - Multiple issues: management, large numbers, accountability, non-participants, deception, etc.
 - Relationship to hostile swarming? Hostile unmanned vehicles? Other threats?
 - Governance and regulatory aspects?
- How to establish and maintain data integrity in open distributed networks, including net-centric environments?

Appendix C: Research Questions

- Creation of a common maritime picture / collaboration tool that allows a complex adaptive mapping where tracks can be inferred, vessels flagged and data mined via a global database
- Develop an optimized array of unmanned sensors to maintain Maritime Domain Awareness (MDA)
 - Approaches to U.S. mainland
 - Global application
- How can one stop the use of a ship as a weapon (SAW)?
 - Maritime 9/11 question
 - Combination of policy and technical issues
- Standoff detection of nuclear, WMD, hazardous materials in containers
 - Assuring threats are prevented and handled
- How does global maritime security relate to overall national directives and laws that govern global security and stability for U.S.?
 - NSPD 44, DoD Directive 3000.05, HR 1084, Foreign Assistance Act 1961
- Repeat above question from international perspectives, both on national basis and as international commitments
- How do we collect information, collaborate, and work together on these many questions?
- How do we organize, rank/triage, and align the various questions?
- It does appear that these many questions can together define a coherent research-program strategy.
- How do we extend information sharing via web-based service-oriented architectures across security boundaries and international boundaries?
- Define and test a model for data sharing among all countries from India to Japan who might accept policy, data definitions, and technical architecture.
- What existing or new USG organization and with what authority is needed to ensure and expedite maritime security solutions to interagency stakeholders?
- How do security interests engage the commercial community for better access to commercial data with incentives to commercial data holders?

Globalization Track, Day 3

Top Research Areas

Globalization Track participants identified the following research areas to be of greatest interest.

- New Forms of Leadership
 - nature of future leaders
 - how do you grow them
- Intercultural Competencies
 - clashes of cultures
- Building Networks of Trust
 - less about command and control, more about relationships
- Climate Change & Energy
 - as drivers for conflict
- National Sovereignty & Interests
- Changing Institutional Culture
- Systems (Human & Technical)
- What drives the research agenda? Theory? Policy? Failures? What kind of questions matter most?
- Groups that systematically structure questions using options are more robust. Can we structure these issues in opposing ways, emphasizing alternatives?
- Look at how we can deal with paradoxes, i.e. with simultaneously true yet apparently contradictory statements.

Appendix D: Participant List

Mr. Arabinda Acharya, S. Rajaratnam School of International Studies, Nanyang Technical University
Major General Herbert “Buz” Altshuler USA, Director of Strategy, Plans and Programs for US Africa Command
Dr. Frank Barrett, Naval Postgraduate School
Dr. Dan Boger, Dean of Research, Naval Post Graduate School
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Dr. Don Brutzman, Naval Postgraduate School
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Dr. Ken Davidson, Naval Postgraduate School
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Dr. Arden Dougan, Lawrence Livermore National Laboratory
Dr. Nicklaus Eggenberger, Swiss Academy for Development
Dr. Gabriel Elkhaim, University of California, Santa Cruz
Dr. Leonard Ferrari, Provost and Executive Vice President, Naval Postgraduate School
Dr. Deborah Gibbons, Naval Postgraduate School
Mr. Greg Gross, Deputy Assistant Secretary of Defense
Dr. Karen Guttieri, Naval Postgraduate School
Senator Gary Hart, Former US Senator, Author and Speaker
Mr. Charles “Chip” Hauss, Alliance for Peace Building
Dr. Alexandre Hedjazi, University of Geneva
Mr. John Hiles, Naval Postgraduate School
Dr. Gary Horne, Naval Postgraduate School
Dr. Tom Huynh, Naval Postgraduate School
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Mr. LEO Tin Boon, National University of Singapore, TDSI Executive Director
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RADM Don Loren USN (Ret.), Deputy Assistant Secretary of Defense
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Dr. Sandra Martinez, Naval Postgraduate School
Mr. Michael Matson, Northrop Grumman
Rear Admiral Lee Metcalf, Director, National Office, Global Maritime Situational Awareness
Dr. Paul Mitchell, Canadian Forces College
Mr. Gregg Nakano, Tufts University
Colonel Dan Nolan USMC (Ret.), Sabot 6, Inc.
Vice Admiral Dan Oliver USN (Ret.), President, Naval Postgraduate School
Dr. Dan Plesch, Director Centre for International Studies and Diplomacy, SOAS, University of London
Dr. Ned Powley, Naval Postgraduate School
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Appendix D: Participant List

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Mr. Chris Vogt, Assistant, Deputy Under Secretary of Defense
Dr Peter Walker, Tufts University
Dr. Starnes Walker, Director of Research, Department of Homeland Security
Admiral Patrick Walsh USN, Vice Chief of Naval Operations
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