NWSI MARITIME GRAY ZONE WARFARE INNOVATION WORKSHOP

November 2021

ABSTRACT
This final report summarizes the NWSI Maritime Gray Zone Warfare Innovation Workshop held at the Naval Postgraduate School 16-19 November 2021 and includes a review of the preparation, process, and the final concepts generated and presented.

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On behalf of the NWSI Maritime Gray Zone Task Force

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EXECUTIVE SUMMARY

The Naval Postgraduate School (NPS) as part of the Navy's education enterprise is to deliver warfighting advantage through improved intellectual capital to meet the challenges of modern warfare. This is achieved through curricula, innovative delivery, and increased integration of wargames and simulation in education forums. This promotes continuous learning, continuous adaptation, the inclusion of diverse ideas, and mission command to ensure battle-minded leaders are ready today to win in the high-end fight. The education complements operationally-based technical competency. The Naval Warfare Studies Institute (NWSI) coordinates the Naval Postgraduate School's interdisciplinary research and education to accelerate and enhance warfare concept and capability development of tactically and technically informed solutions for the U.S. Navy and Marines Corps.

This report summarizes the NWSI Maritime Gray Zone Warfare Innovation Workshop, the first effort of the NWSI Maritime Gray Zone Research Task Force (MGZ RTF). Three teams were facilitated through a rapid concept generation process using tools of user-centered design to respond to the design challenge: *How might emerging technologies, new operational concepts, and new force capabilities contribute to a more effective force in the geo-political competitive phase to deter adversaries, strengthen allied relations, and shape the strategic and operational environment?* After initial input on the problem space from an array of subject matter experts and eight hours of focused concept generation and development work, the three teams presented their best ideas on the final afternoon of this four-day workshop:

- **Future PACE Networks:** a concept around future primary alternate contingency and emergency (PACE) networks.
- **Maritime Modular Infrastructure Development:** a scalable, repeatable, and dual-purpose infrastructure development capability to achieve national security objectives as well as to impose costs and compete with China and other malign actors in the future.
- **Challenge the Adversary via 5G:** a peer-to peer- end-to-end encrypted and secure network leveraging blockchain technology providing local and regional infrastructure as well as a network to piggyback off of while masking U.S. force presence.

These ideas will seed future work within the MGZ RTF across NPS, and within the NPS Defense Analysis Applied Design for Innovation curriculum.

WORKSHOP OVERVIEW

This Warfare Innovation Workshop was linked with the NPS Defense Analysis curriculum and was the first activity within the newly established NWSI Maritime Gray Zone Research Task Force that will do follow on work in this vast and complex problem space. To address pandemic mitigation concerns, this workshop was offered in a hybrid participation format. The Maritime Gray Zone (MGZ) Warfare Innovation Workshop (WIW) was scheduled 16-19 November 2021[1] on the NPS campus in Monterey with remote participants joining us on the NPS "Virtual Campus" via MS Teams.

Preparation

Several preparation sessions – part of the Discovery phase of the user-centered design process – were held in advance of the workshop and recordings were posted online for those who were not able to participate in real time. In addition, several curated written resources were posted to give concept generation team members a fuller understanding of the problem space in advance of the workshop since the schedule only allowed for eight hours of focused concept generation time with their facilitators over the three and a half days of the workshop.

Specific sessions either recorded and posted in advance of the workshop or offered to participants in real time during the workshop included:

- **NWSI SEAPOWER CONVERSATION: Intermediate Force Capabilities** – Col Wendell Leimbach USMC, the Director of the Join Intermediate Force Capabilities Office reviews the relevance of IFCs within the National Defense Strategy.
- **NPS SYSTEMS ENGINEERING SEMINAR: Maritime Sabotage Impact Modeling** – Dr Wayne Porter reviews modeling done for NSW on the impacts of maritime sabotage.
- **NWSI DISCOVERY SEMINAR: Crowd Dynamics Modeling Toolkit** – Dr Anne Marie Baylouny reviews the modeling toolkit her team developed to predict crowd dynamics in response to a variety of stimuli.
- **Tools of Design Seminar** – NWSI Concepts Branch Lead Ms. Lyla Englehorn introduces tools of user-centered design ideal to include in any "toolbox" to approach a complex military problem space.

Sessions specifically for this workshop included:

- **Workshop Overview & Tasking** – the military lead gave an overview of the NWSI Maritime Gray Zone Research Task Force, and the NWSI Concepts Branch Lead shared the workshop design challenge and guidance on the workshop process.
- **The "Art of War" Analytic Wargaming** – a representative from the Office of Commercial and Economic Analysis (OCEA)[2] presented their summary and findings from the OCEA/PACAF[3] Counter "One Belt One Road" (OBOR) Project that leveraged user-centered design to reach this

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[1] Full schedule included in Appendix A

[2] The Office of Commercial and Economic Analysis (OCEA) supports the Services and OSD in assessing the commercial and economic risk to the defense industrial base. While OCEA is staffed with Air Force and Navy personnel, its analysis of the defense industrial base supports the strategic industrial base risk mitigation activities of the entire Department, as outlined in the report to the President in response to Executive Order 13806, and in support of the National Defense Strategy (source https://www.afocea.com/about-ocea).

[3] Pacific Air Forces (PACAF) https://www.pacaf.af.mil/

key recommendation: *The U.S. can reduce the influence China gains via OBOR by increased engagement with host countries through alternative projects; the U.S. does not have to stop Chinese investment to succeed. Beyond the U.S. commitment of resources, broad multilateral engagement is key and close cooperation with allies and partners is essential. The U.S. must also understand and accommodate host nation interests to ensure successful outcomes for both the U.S. Government and the host nation.*

- **Mapping Gray Maritime Networks** – an NPS researcher presented his team's work to identify, map, and track gray maritime networks in the South China Sea using commercially available ship tracking data to identify and track vessels of interest, and then identify patterns and network attributes (nodes and links) using network analysis tools and methodologies.
- **Offset Advantage & Peer Competition:** *Omni-Domain Irregular Warfare* – a former Chief Technology Officer, a former Chief Financial Officer, and a former Navy SEAL shared their perspectives on the maritime gray zone problem space.

Readings posted for review in advance of the workshop included:

- **Mapping Gray Maritime Networks for Hybrid Warfare[4] (JUL 2020):** In light of the current National Security Strategy and the 2018 National Defense Guidance, the impact of hybrid warfare and 'gray-zone' maritime activity in support of great power competition among nations has become an increasing area of concern. This short article provides an overview of an NPS research team's work to develop a tool to map gray maritime networks. This Center for International Maritime Security - Center for International Maritime Security article by NPS faculty members Chris Callaghan, Rob Schroeder, and Dr. Wayne Porter is part of CIMSEC's Fostering the Discussion on Securing the Seas series.
- **Irregular Warfare Mission Analysis (OCT 2021):** This mission analysis by the Office of Irregular Warfare and Competition, Joint Staff Joint Force Development and Design Directorate (J-7) is the Department's first comprehensive review of irregular warfare since 2007.
- **Maritime Sabotage: Lessons Learned and Implications for Strategic Competition[5] (OCT 2021):** The Center for Naval Analysis (CNA) examined an old concept (sabotage) to distill new insights to inform future DoD decisions regarding sabotage and its potential use.
- **NATO's Response to Hybrid Threats[6] (2015):** a written distillation of the April 2015 Wales Summit, a conference to review NATO's response to hybrid warfare that gathered scholars and senior decision-makers from across the Alliance for a two-day session in Rome. The 300 pages includes facts, points of view, and opinions offered at the hybrid conference as well as independent papers commissioned and published by the NATO Defence College (NDC) Research Division.
- **Gray is the New Black:** *a Framework to Counter Gray Zone Conflicts[7]* **(2021):** in this article in in Joint Forces Quarterly issue 101 CAPT Heather Bothwell, a senior DIA intel officer, discusses the

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[4] Article posted https://cimsec.org/mapping-gray-maritime-networks-for-hybrid-warfare/ (last accessed 27 JAN 2022)

[5] Report posted https://www.cna.org/CNA_files/PDF/Maritime-Sabotage-Lessons-Learned-and-Implications-for-Strategic-Competition.pdf (last accessed 27 JAN 2022)

[6] Report posted https://www.files.ethz.ch/isn/195405/fp_24.pdf (last accessed 27 JAN 2022)

[7] Article posted https://ndupress.ndu.edu/Media/News/News-Article-View/Article/2556217/gray-is-the-new-black-a-framework-to-counter-gray-zone-conflicts/ (last accessed 27 JAN 2022)

nature of gray zone conflict and the strategic imperative to understand this often gradual and ambiguous threat.

- **Lifting the Veil on the Lightly Manned Autonomous Combat Capability[8] (JUL 2020):** this Center for International Maritime Security (CIMSEC) article gives an overview of the Lightly Manned Autonomous Combat Capability (LMACC) developed by an NPS research group.

Process

Working within a potential future scenario titled *Hybrid War 2045*[9] – teams were given the design challenge:

> *How might emerging technologies, new operational concepts and new force capabilities contribute to a more effective force in the geopolitical competitive phase to deter adversaries, strengthen Allied relations, and shaped the strategic and operational environment?*

In addition to addressing the design challenge, participants were asked three specific questions:

1) *Do we have the right capabilities to confront these problems?*
2) *Do we have the right concepts to confront these problems and.*
3) *Do we plan to integrate them the right way? And if so, how?*

Three student teams had eight hours to go from a blank sheet of paper to their final concepts. The first step in a rapid design sprint is Discovery, intended to explore the vast dark problem space and gather data. This data comes from presentations included in the workshop, archival readings posted online, and from individual team members' knowledge of the problem space. From that data each team crafted a problem statement to scope down the problem. This problem statement, often crafted into a "How might we…" statement is the springboard into the solution space. The next step is ideation – first divergent where everything goes up on the board (*see Figure 1*), and then teams converge down on a concept to develop further. Finally, the team develops their concept further and creates a prototype. The first prototype is often simply a "flipchart pitch" to share their idea with others for feedback. This sharing session is the first test of their idea. Teams will then incorporate feedback into a second or third prototype to pitch to a wider audience for feedback and recommendations for further work.

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[8] Article posted https://cimsec.org/lifting-the-veil-on-the-lightly-manned-surface-combatant/ (last accessed 27 JAN 2022)
[9] Written scenario included in Appendix B

Figure 1. Concept generation team working the design challenge during the NWSI Maritime Gray Zone Warfare Innovation Workshop, November 2021.

GENERATED CONCEPTS

All three teams worked the same challenge, and each took different paths to address the tasking. From the many ideas they generated, each team selected a concept to develop further and present at the end of the workshop. To address this challenge and get to a presentable concepts in eight hours required the support of three facilitators – Defense Analysis faculty member Kristen Tsolis leads the Robo Dojo maker space on the NPS campus, NPS Center for Executive Education facilitator Ann Gallenson conducts flag level executive seminars, and Cebrowski Institute Chief Learning Officer Warren Yu is instrumental in the Innovation Leadership course here on the NPS campus.

TEAM 113

"You go to war with the army you have, not the army you might want or wish to have at a later time." — Donald Rumsfeld

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This first team was a mix of Special Operations Forces (SOF) from across services and they rephrased the Rumsfeld quote to "*You go to Hybrid War with the communication framework matrix you have, not the framework you might want or wish to have.*" The team's concept was presented by a U.S. Air Force pilot and their problem statement focused on SOF teams on the ground:

> *How might we enable embedded SOF teams in the Gray Zone to communicate status and intent internally and externally across the spectrum of conflict, while managing signature to reduce risk of exposure?*

When operating in a hostile or potentially hostile environment *"[t]he assumption is they're trying to stay hidden."* The team's proposed concept sought to minimize signature – from the electromagnetic spectrum to infrared to overt visual signals. The team presented a framework to approach for SOF teams to communicate in a hostile future environment. The team assumed the scenario put them somewhere in the Gray Zone strategic deterrence area during the competition phase short of full-scale open armed conflict.

Future PACE Networks

The team proposed a concept focused on a primary, alternate, contingency, and emergency (PACE) communications procedure using multiple networks or communications methods. An embedded SOF team deployed today would choose a from a range of communications options, prioritized to the environment, using a traditional communications decision framework for networks and ground-to-air communications. These choices traditionally are presented as primary, alternate, contingency and emergency (PACE) communications methods. However, traditionally, PACE does not adjust as risk changes. As an alternative to PACE this team proposed a multi-layered matrix where forces have a menu of different communications options. Based on risk of exposure at any given moment future forces may choose to use all options available in a non-kinetic, potentially hostile, environment or use a combination of different methods at once.

The team presented risk of exposure along the spectrum of conflict (*see Figure 1*) the Y-axis on the left is risk of exposure. Along the bottom, the X-axis, is the spectrum of conflict from over to covert, tactical to

strategic, and from the competition to strategic deterrence where tensions rise as you go to the right. Towards the left is a less hostile environment, to the right is more hostile. This does not necessarily mean that as you get closer to conflict that there is automatically going to be more risk. For example, the red dotted line represents where operations will likely go to kinetic versus non-kinetic. The stars are communications options.
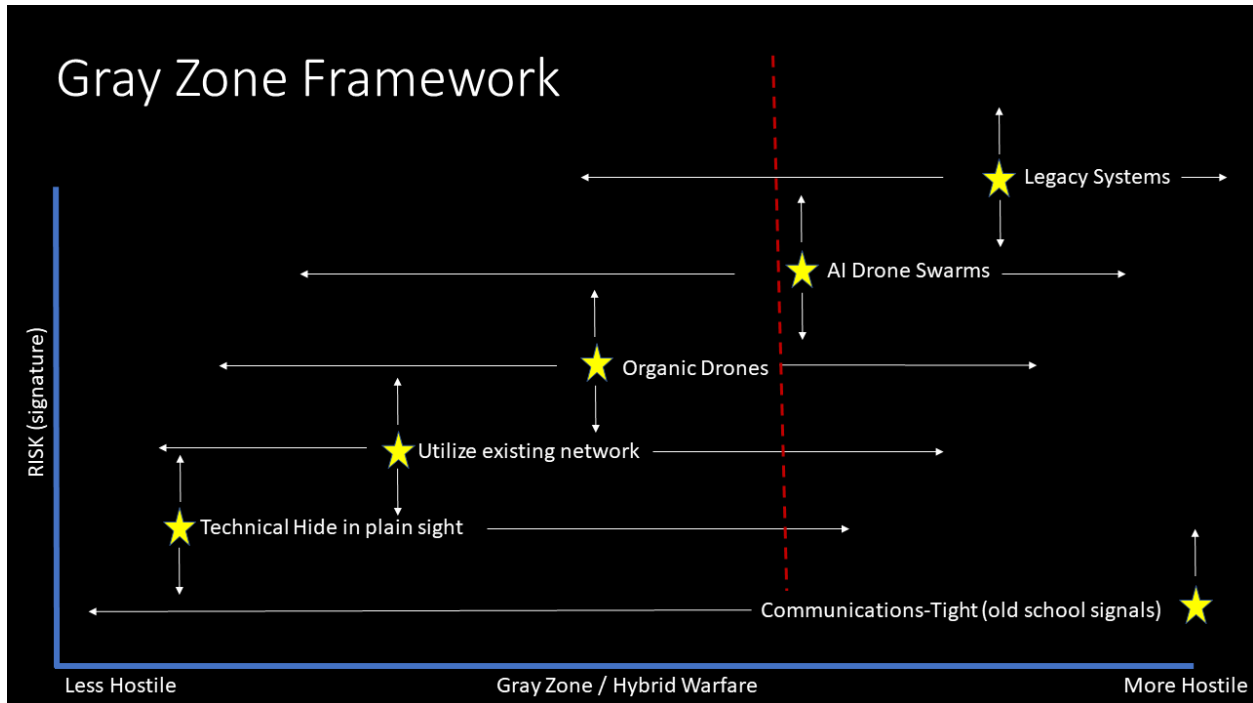

Gray Zone Framework

Figure 2. Team 113 gray zone framework with risk on the Y-axis and spectrum of conflict on the X-axis The stars represent different communication options, and the red dotted line is the threshold between non-kinetic and kinetic conflict.

Generally, the signature that that you give up is going to increase as communication methods expand in complexity and amount of data. This was the key inspiration for this team this week – how do we get a SOF team to talk to somebody when they can't use the radio and give up their position.

From the bottom to the top (*see Figure 2*), the technical *"hide in plain sight"* method uses specific pre-set actions to send and receive data and relies on code matrices such as ATM withdrawals, social media and cell phone website interactions, gaming networks and chats. An embedded SOF team does not want anyone to know that they are there. The team focused their efforts on this phase. For example, an embedded SOF team member making a predetermined bank account withdrawal on a certain date – that action sends a predetermined message.

Next, to communicate by utilizing the existing networks – both software and physical and digital infrastructure – allows forces to leverage a secure communications network and choose available means such as wireless or fiber enabled by software kernels at each end. This method involves low frequencies as part of a spectrum and technology that already exists. Forces could send data chunks that spread through available communications networks. These messages would not need to be encrypted but would be very hard to detect – like hay in a haystack. The receiver would then parse the data pieces back together at their end allowing embedded forces to transmit whatever and whenever they need. At

this point in the conflict spectrum the team assumed that tensions are not yet rising so forces will not need to send lots of information. To send an encrypted message with software enabled kernels, a SOF team could choose the best route. For instance, if you know who you're trying to send it to, the data packet could jump from a wireless signal to a fiber optic channel to make it make its way around any detection. The technology exists. Although a full explanation of this cross hardware dependent concept would be require for further development, the team was only tasked with generating the see of the idea in the eight hours available to them in this workshop.

As tensions rise the communication methods will likely need to change. The next two options involve infrastructure and hardware – either controlling existing commercial drones or blending in with them. This does not mean if you're using AI-enabled drone swarms that the risk goes up. Generally, the signature that that you give up is going to go increase. The team scoped their problem statement to – *how might we get a SOF team to talk to somebody when they can't key the radio and give up their position?* An organic drone is a small drone that when deployed does not turn on a communications signal until it is well away from your position so as not give up your location. This organic drone then transmits a message and either self-destructs or returns. The key is that the organic drone would be one of many ways that SOF could communicate but may not be the primary method rather a backup – while prioritizing covert communications. The small drone, likely part of a swarm, would not be complex so if discovered or intercepted would not compromise the SOF team presence.

The small organic drones might also be used to create local mesh networks. As conflict becomes more hostile, the environment will become more degraded and more denied so forces will likely not have access to tactical data links as they prepare for directing kinetic fires. Moving up the ladder of communications options, the team envisioned between two and ten small simple organic drones spread out to create a network that would enable SOF team communications within their team or with aircraft or other assets. This ad hoc network may need something more robust, like an AI-enabled swarm or a set of AI-enabled swarms. But once you start using the drones in active conflict they become "one time use" as they will be exposed. These organic drones could be embedded or cached by the SOF teams preplaced in different areas. The SOF teams would control deployment and activation, or the organic drones could be controlled by an aircraft or some other external agency that gives an attack command send some sort of message through a prescribed action. Working with a very robust 5G network, if a few drones go down, the swarm still has the ability to operate. But again, with use the risk goes up. There are counter drone swarms to contend with, but the idea is that you're not going to have the traditional tactical data link to rely on.

From legacy systems, a SOF team might use a JADC2 network if they are trying not to give up their position and that would be at one end of the range. In a less hostile environment it might be risky because the communication systems compromise the SOF team's position. As the conflict becomes more hostile, they would choose a different legacy system. For example, a handheld radio is the quickest and most efficient way to get your status and intent to an aircraft. However, that handheld radio is also going to compromise your position. Legacy systems are also important when newer communications channels are jammed or blocked during a conflict. Old school physical signals-based communication warrants further study. For instance, a set of pre-planned physical signals by the SOF teams that are either radar significant or use certain signals at a certain time could mitigate a loss of communications. Similar to the "hide-in-plain-sight" communications concept, but the aircraft operators could interpret this set of pre-planned signals in real time.

From the overall framework, the product is envisioned as an AI-augmented decision matrix to identify the best ways to communicate at any given time, environment, or set of conditions. The AI produces five options, and then the SOF team chooses how to proceed. Eventually, this might be automated where a SOF team chooses who they want to send the message to, enables the AI, and then it chooses the best path and the best method. This may be far in the future but is the direction the team predicted.
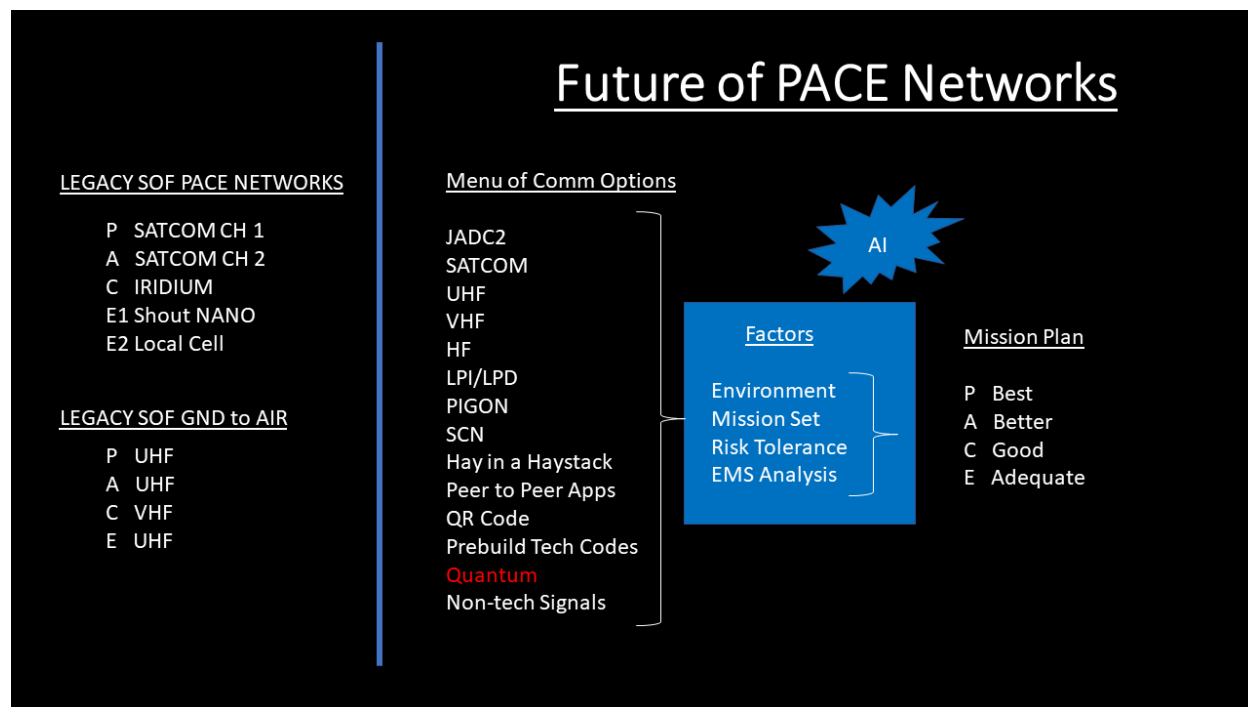

Figure 3. The future of PACE networks proposed by Team 113, with legacy networks on the left and a proposed menu of options to be considered by an AI-enabled decision tool.

Legacy PACE communications plans (*see Figure 3, left*) are the current construct. SOF teams will deploy with a SATCOM terminal with one or two channels for your networks. SOF team ground to air communications will have two primary frequencies, and that's where it stops. The team proposed a menu of communications options (*see Figure 2, right*). JADC2 might be the riskiest for certain areas in some situations. A SOF team could use UHF, HF, a secure communications network (SCN), or use the "hay in a haystack" option presented earlier. This concept generation team also discussed quantum communication methods but noted that it was likely not technically mature enough to include in early concept development. However, quantum has potential because it allows for unencrypted yet unhackable communication. *"That would be great, but I don't think that that really exists at the tactical level right now."*

The team proposed that artificial intelligence would incorporate environment, mission set, risk tolerance, and electromagnetic spectrum analysis inputs and then identifies the best communication options.

Questions & Discussion

The range of operating environments considered was the first topic of discussion. The concept generation team considered urban environments all the way to the remote Arctic. In the Arctic a SOF team would likely have no existing infrastructure to use and no ability to access geostationary

communication capabilities. How might that factor into possible communications options? The options available depend a lot on where you are. *"You go to the gray zone with the matrix you have not the one you want, right?"* If a SOF team just has one option it may not survive, but maybe the best option in one environment may not be best in another – depends upon where you are and what you have and the mission.

The next discussion focused on where this concept might be most impactful in the conflict continuum. The team focused on the area just before kinetic strikes or right after – *"they're behind the enemy lines so if they give up their position it could be used to provide that first strike or retaliatory one where they're still not supposed to be there."* This assumes that the SOF team would be hidden. Acknowledging that this is a very complex problem space, framing the concept around legacy systems and methods illustrates that we've actually come a long way but are nowhere near where we ought to be. Any thinking around this kind of operation and how we communicate is critical. At one time you could really hide out there and nobody would ever find you, but with emerging technology on both sides that is no longer the case. How to preserve maneuver space while deployed is key.

The next question was if there was any discussion on the team about when you cannot communicate. What does that mean? What might that look like? Although the team discussed this contingency they decided not to focus there, but rather on how to choose communication methods based on risk. In situations where a SOF team cannot communicate they might use the hiding-in-plain-sight method proposed by the team using existing social media accounts in a pre-planned way or with a pre-planned innocuous message representing an essential message. Or the SOF team may have a set of instructions, like they go out at sunup and put a preset barcode or QR code on top of a building and at an established time they remove it. There are several ideas that the team threw out there during their concept generation work time.

The final part of the discussion focused on where these ideas might go next. A workshop lead suggested the NPS student team might find an opportunity to test the "communications menu" concept in a small scale wargame or directed study because there may be several students that want to run this idea.

TEAM 111

Team 111 approached the design sprint using a modified version of operational design methodology. This team included Army special Operations, Naval Special Warfare, an officer from Greece, and some civilians from academia. They wanted to frame the problem as best they could before moving into generating solutions. The team started their work by describing the current state of this problem space:

> *China is rapidly increasing their Belt and Road Initiative to further bolster their political, economic, and military prowess globally.*

The team next defined their desired end state:

> *The U.S. and our partners use increased capabilities to better compete with China and increase our partnered capacity within Global Power Competition now and in the future.*

From there the team created a problem statement:

How might we counter China's Belt and Road Initiative to enable and empower our partner's resilience and growth?

Maritime Modular Infrastructure Development (MMID)

Team 111 recommended implementing a scalable, repeatable, and dual-purpose infrastructure development capability to achieve national security objectives and impose competition costs on China and other malign actors in the future. The solution this team proposed was maritime modular infrastructure development (MMID).

Although intended to apply to any area of responsibility (AOR) to explain the MMID concept the team shared a West Africa vignette in the Gulf of Guinea. With their problem statement in mind, the team identified vulnerabilities as the Belt and Road Initiative expands across Africa. As China expands its influence in the port activity of Guinea, Senegal, Angola, and Nigeria their ability to influence the U.S. mainland from Western Africa increases.

Without much maritime background on this team, they got creative and looked at how they might impose costs on China and diminish the Belt and Road Initiative's influence. They then realized the gap to leverage might be in nonstandard maritime capabilities like dual-purpose vessels and shipping capabilities. From there the team looked at the opportunity to build a network or offset using nonstandard dual-purpose vessels. In the Gulf of Guinea, in 2045 there will likely be Smart Cities monitoring capabilities and port infrastructure provided by China through the Belt and Road Initiative investments underway right now. These capabilities will likely limit the DoD's ability to access the regional population and have effects, whether kinetic or non-kinetic. If we flood a harbor or market with nonstandard vessels, much like the use of fishing vessels in WWII, it would reduce DoD signature in this maritime environment. This would allow the U.S. forces to launch activities in the AOR via a network, ideally through local populations. This approach would adjust as the competition continuum changes. If we are still in competition phase the DoD presence will obviously be smaller.

Figure 4. Maritime modular infrastructure development (MMID) concept overview.

After presenting the vignette (*see Figure 4*), the team presented a step-by-step framework of the MMID concept. The intent is to have two lines of effort. The first broader effort is a public-private enterprise to build out a modular, scalable platform because it is crucial to not have a U.S. DoD face on it. The intent is to find genuine concerns of that local population in that local nation, whether it's countering illegal fishing, cleaning up pollution in the oceans, or improving communications networks where they're

building communications hubs from these platforms. Essentially, identify those partner nation needs and build out a platform to address them.
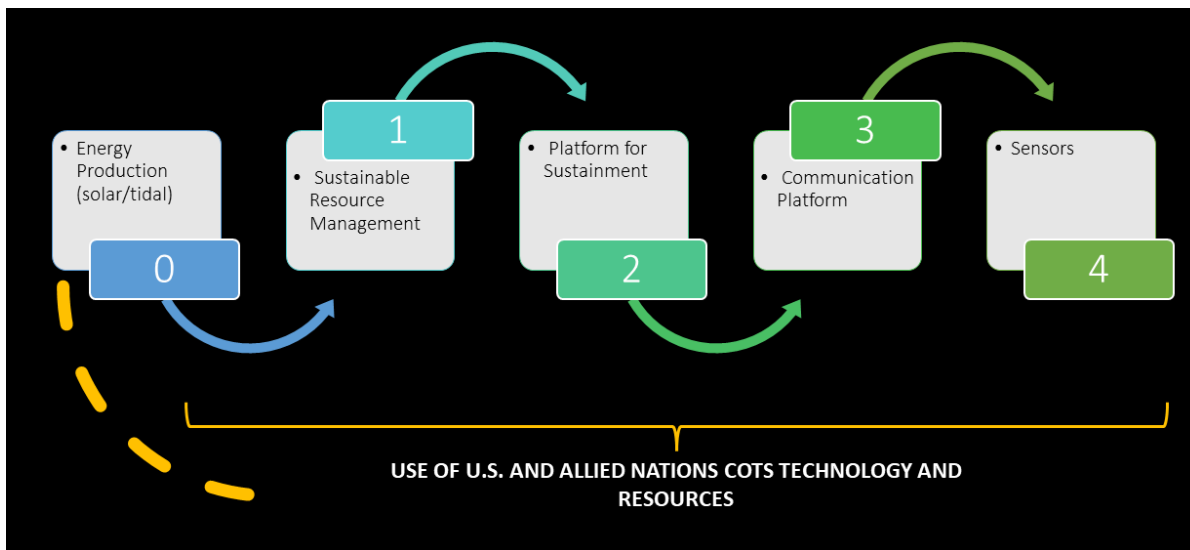

Figure 5. MMID concept development energy example.

The team started with an energy production example (*see Figure 5*) where it is key to identify the proper vessels and the containers to launch from. CONEX boxes are globally available. "Every country uses them. They're common and shipping yards." With a modular vessel leveraging CONEX capability, working with the local nation to identify what they need and then tailor the platform to counter illegal fishing for instance. The first step is having a vessel or nonstandard capability that has energy production so that it is sustainable. The next step is to identify the resource. The team used the example of vertical farming.[10] If the U.S. is helping a regional nation increase food production sustainability and build a new market to counter China's influence, something as creative as vertical farming would give the U.S. more access in that location. Over time these platforms continue to expand. Sustainment gives the U.S. more access to land-based networks of people to access those vessels and communications platforms. If the U.S. and allied forces help the local fishermen build a new communications platforms based on the maritime nonstandard capability and sensors, it would reduce their reliance on a Chinese dominated cellular infrastructure.

The second line of effort in parallel with that first public-private partnership and cooperative agreement with the local is the DoD line of effort help fund some of these initiatives. The Spirit of America[11] provides tools for U.S. partner forces that were not available to acquire through traditional U.S. DoD acquisitions process. The team proposed something similar where the U.S. DoD would provide a

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[10] Vertical farming is the agricultural process in which crops are grown on top of each other, rather than in traditional, horizontal rows. Growing vertically allows for conservation in space, resulting in a higher crop yield per square foot of land used. Vertical farms are mainly located indoors, such as a warehouse, where they have the ability to control the environmental conditions for plants to succeed. [source: https://boweryfarming.com/vertical-farming/]

[11] Spirit of America is a 501(c)(3) non-profit working alongside U.S. service members and diplomats to improve their safety and success. U.S. troops and diplomats identify critical local needs and help them take action through donated funding which enables Spirit of America to deliver resources immediately when and where they are needed most. [paraphrased from https://spiritofamerica.org/about]

seamless close relationship but DoD not to face of the relationship. The DoD is still tied in with these efforts and understands as these platforms are identified and developed in the early phases they could create comparable modular platforms to replace as a threshold escalates in this competition continuum. In the early phase the host nation benefits monetarily as the new MMID is building capital for the local nation and for the U.S. by creating unique energy infrastructure capabilities, building out communications platforms to support these partnerships. The U.S. DoD would then have a comparable modular system to place as the competition escalates toward conflict. From the SOF perspective, this allows us to get creative with things like a mother ship concept for operations where you replace whatever type of platform is running or supplement a DoD-based platform. A SOF force might stage out of a trained partner force or trained maritime security elements could place sensors. What that allows is a lower signature. Markets already flushed with genuine public commercial sector vessels so it helps reduce the SOF force signature, and as that technology or communications platforms advances teams might then place these new C2 methods on these nonstandard maritime capabilities which reduces the signature making it more difficult for adversaries to identify and implement mitigation thus diminishing their returns. This also allows us to gain access and reduce China's role in that particular port and the regional economy, and then gives us access to place capabilities and assets if things do escalate.

The team addressed the uniqueness of their proposed solution – specifically about how it is different than Overseas Humanitarian, Disaster, and Civic Aid (OHDACA)[12]. One of the team members from a SOF civil affairs perspective had worked with OHDACA a lot. From a security cooperation entity this might sound very similar to what they do. Some might draw comparisons, but the difference is that this is scalable and sustainable, and the longevity of most of their programs is limited in terms of the funding scope as well as their applicability in different locations and the authorities that are required to bring them into fruition. The team felt their solution was much more flexibility in that regard.

Questions & Discussion

The discussion started around the topic of contracting and whether the team envisioned this solution involving a government contract with a commercial entity that would then allow the government or the DoD to come in and later date to use that platform for launch. The team clarified that no, not necessary to use at a later date but ideally the creation of the nonstandard platform could be stimulated to not be a contract through the DoD. The platform itself would be scalable so that the DoD could create a compatible one to add in later on rather than commandeer a current platform.

The next question was about the team's assumptions in the scenario. In the year 2045, are the ports in these smart cities owned by China? The team did not look at specifically at port ownership, rather that there would be regions that may be experiencing debt trap issues from the Belt and Road Initiative development occurring now in some of the African nations. In some of the software applications where they've already got back door access issues biometrics are already being tracked, so whether China technically owns it or not they will likely be in a dominant position now and in the future.

The final discussion was if the team envisioned their proposed solution being employed inside territorial waters or out in international waters. The team discussed that a little bit and decided that one of the benefits of their solution is that it could be employed in both territorial and international waters. If you need an offset being in international waters, you can do that. Ideally, regional nation cooperation, that

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[12] Source https://www.dsca.mil/tags/ohdaca

first line of effort, allows this solution to be employed in territorial and internal waters which gives greater access in the littorals, and the MMID could be moved – it's not static. If you use a crude analogy, a riverboat casino kind of idea, you have an established economic point of presence that's actually just offshore in international waters you could probably use that as a little bit of diplomatic or separation to tee up some interesting activities or interesting points of presence that might not be possible if you're trying to actually do something inside that country's territorial waters.

Another thing that the final commentor really like about the MMID is that you're creating something that is additive and desirable by the local populace, and so if it's seen as an adversarial action it's actually in the adversary's worst interest to do something about it. It makes them look like the jerk if they try to take out what we've added that has contributed in a positive way so it presents a dilemma for the adversary at a higher level.

TEAM 109

The final presentation was by Team 109. This team consisted mostly of SOF from the Army and did not have a maritime influence so no bias in there, and they were grateful to have two guests from warfare centers on their team inject external expertise. The started by framing their own problem statement from the data available following design thinking process and answering these four initial prompts:

1) *how might we…*
2) *for whom…*
3) *in a way that…*
4) *so that…*

That gave the team three main problem statements. After that, each NPS student team member generated several ideas to solve the problem and then handed this individual work over to the full team to test their thinking. This process generated a list of 210 different ideas[13] and then ranked them using three lenses:

1) *What's compelling?*
2) *What's relevant?*
3) *What's sustainable?*

Because none of the team members had a strictly maritime perspective, they did not generate standard solutions involving legacy assets like aircraft carriers but solutions they saw from their own perspectives. Next, the team presented the ideas the they selected for further development. One of the three problem statements created was:

> *How do we impose costs on the Chinese Communist Party in order to support U.S. and allies and partners objectives around the world in a way that achieves our policy objectives without unnecessarily escalating tensions with China to potential World War Three scenario in order to counter Chinese influence across the globe while reinforcing U.S. and allied influence specifically in the areas identified as centers of gravity worldwide such as those key port areas or littoral spaces that are important for economic activity?*

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[13] see APPENDIX C p 26

Of the 210 ideas generated, 63 ideas specifically related to this problem statement. This framework of how to impose costs for the adversary in everything that we're doing. The team then presented the top ten ideas ranked by the team and external partners which showed some variance. Their facilitator encouraged the team to think outside the box as much as they could and trust the design ideation process.

1	create 'stable coin' pegged to the dollar to penetrate the crypto space
2	export 5G network capability throughout developing world
3	Compete on an international stage with better technology (i.e. 5G)
4	Build in Africa right across from Chinese companies
5	Buy land areas that are critical to China's One Belt, One Road
6	utilization of a device to scare fish away from Chinese fishing fleets (noise/something)
7	Place sanctions on China
8	push US companies to stop bowing to Chinese regieme (Disney, NBA, etc.)
9	increased partner engagement with African/Asian nations
10	US naval support to 'policing' EEZs

Figure 6. Top ranked ideas generated in response to the first problem statement, Team 109.

Challenge the Adversary via 5G

The top three of those ideas all had to do with 5G technologies and cryptocurrencies (*see Figure 6*), which has been a hot topic and a bunch of the innovation design curriculum stuff have been talking about. In the feedback sessions and practice iterations with the facilitators the company Helium[14] was mentioned because they combine 5G wireless connectivity with cryptocurrency. An individual purchases a router that acts as a gateway to the network itself. Internet of Things devices, watches in smart cities, smart telephone poles and light poles and things like that connect to these routers and they actually provide money access. They pay for the access to the router, and it builds money for the individual who owns the router point and so it's built as a peer-to-peer network. It's live right now, and there's tens of thousands of these routers around the world. You can actually go to their website, and you can see where each individual access point is approximately located.

What the team liked about this idea was it built economic activity for local areas in a way that would be well received because it is not adversarial, and it would not be perceived as the U.S. taking advantage of the of the local populace. Unfortunately, the team's design process took long enough to generate ideas that Team 109 did not have a chance to develop each one of these ideas. *"However, if there is a chance to do another design sprint picking up where we left off and taking these things forward, I think we came up with quite a few interesting ideas that could have some benefit in the future."* To address the problem statement of how might we impose costs on China in every phase of the game – "*because you know it has kind of come down to a zero sum game*" – the establishment of a system like Helium to build infrastructure for the local economy to give the local people access where they might not have had access before is a win. This could be a completely peer-to peer-network because it uses blockchain technology that is all end-to-end encrypted and secure so it would create infrastructure and a network to piggyback off of while masking U.S. force presence.

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[14] Helium was founded in 2013 by Shawn Fanning, Amir Haleem, and Sean Carey, with a mission to make it easier to build connected devices. From the Helium website: *"Powered by the Helium Blockchain, The People's Network represents a paradigm shift for decentralized wireless infrastructure."* (source: https://www.helium.com/)

The next team member gave an overview of his problem statement:

> *How might we block the spread of China's economic influence in Africa to support U.S. forces dependent on allied ports and markets, and worldwide trading routes and chokepoints such as the Red Sea and Mozambique Straits in a way that development aid without "value constraints", military assistance (military and civilian) and education out compete what the adversary has to offer and will over time change the perception of the U.S. for the better so that the appeal of China's Belt and Road Initiative breaks and we "own" our own Belt and Road?*

Commenting on the process itself, the team generated over 200 different ideas to start because normally when a team starts a design thinking process, after crafting a problem statement the first twenty or thirty ideas are very conventional. The more ideas a team generates, the more creative and crazy they get. That is how to reach the truly innovative thought space.

The team commented on this rapid concept generation process: First, you must be aware of your own design flaws – your own biases. When you address all these different tasks, especially in this time frame of eight hours, there is not time to fully explain and develop different ideas. Rather, everyone ranks the seed of the idea with a rough picture. Next, the team learned to identify flaws in their thinking about different regions in the world. For instance, *"[…] Africa is not only poor people living in a desert. It's way more than that."* The cell phone coverage in that region for the most part is really good compared to other more traditionally developed regions around the world so might be an excellent environment for a communications network concept. Correcting early assumptions in any given problem space will prevent a team from going the wrong direction through this process. Finally, use a holistic approach and avoid simply diving into these concepts but remember the adversary. In this problem space the team continued to think about Chinese approach and their unrestricted warfare or combined warfare approach. Basic interaction theory shows us that when both actors use the same approach, the stronger active win. With China, it is important for us to identify flaws in their approaches – and even better, we have to evaluate own approach to identify and fix flaws.

Questions & Discussion

The discussion focused on the quality of the team's analysis. In the short time they identified some really good opportunities and this initial analysis was solid. The team was asked if they thought about things that could be done at a larger scale or higher scale in the maritime environment, rather than the land-based environment, that imposed costs on China that might lead to confrontation but not conflict. The team responded that they really tried to consider ideas that would not escalate any confrontation in terms of overt violence. However, it is not necessarily wrong to escalate into more conflict specifically if the conflict is economic or other DIME[15] component rather than strictly military. This warrants time to talk about. Sometimes talk avoids conflict in confrontations where we might confront something but do not actually go to blows but maybe "false" blows. It is important to give ourselves options to back away, action plan strategies opposed to going through to open conflict.

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[15] diplomatic, informational, military, and economic

CLOSING DISCUSSION

The NWSI research task forces are designed to respond directly to a Naval leadership problem space, a concern, a gap – things that keep people up at night. Each task force has a military lead and an academic lead and will gather those on campus who are working in the particular problem space to respond to the Naval leadership demand signal.

NWSI Maritime Gray Zone Research Task Force Overview

The intent of the MGZ RTF is to surface some of the work and ideas that are already living on the NPS campus to coalesce, catalog and communicate them to the Fleet, the Force, and to the to the developers in warfare centers, academia, and industry. Within the NPS campus community the task force will make sure we know what's going on in MGZ work overall. As one might find in any large organization, one of the biggest challenges NPS has is that we do not always talk effectively amongst ourselves.

Although the concepts generated during this initial workshop may not be what sponsors and leaders were expecting when I AFSOC decided support this, most of the ideas presented relate to interchangeable concepts usable throughout the world. Several concepts used different African regions in their examples. However, these solutions could be employed in the South China Sea, South America, or the Arctic if a future conflict required. These solutions presented by the teams are not weapon systems. They are wider whole-of-government responses involving tactics to policy.
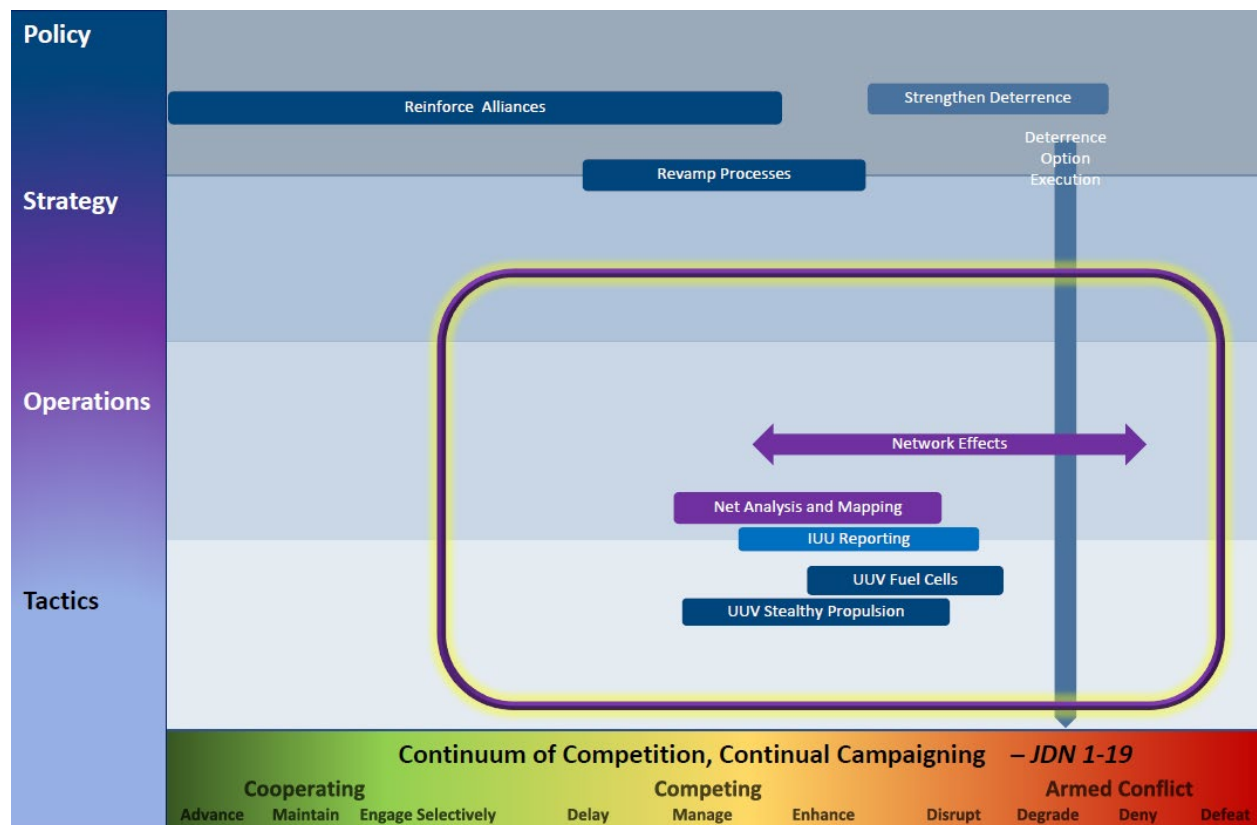

Figure 7. The proposed scope of the maritime gray zone extends from tactics to policy (y-axis at left) and from cooperation to armed conflict (x-axis along bottom).

The scope of the MGZ RTF is still evolving. Defined as the competition space in the maritime environment between countries prior to open armed conflict as they employ all the elements of national power in support of their national goals (*see Figure 7*). Part of the work is to identify the right and left limits of the maritime gray zone research space for the NPS research and educational community and then make sure we know what resources are already available on campus and what work has been done, is underway, or is planned. This will help NPS determine what we still need to move forward, so that we might then go to Navy, Naval, and Joint leaders and planners with recommendations in MGZ problem space. Whether that's a technology question, a concept question, a strategic thinking question, the MGZ RTF will bring that interdisciplinary and cross-disciplinary response.

Please watch for additional efforts and events as NWSI moves forward with the MGZ Research Task Force. The MGZ research task force will incorporate some of the ideas presented and integrate them with the work already underway throughout the NPS research community with the tenured faculty and less established research efforts around campus.

NPS Defense Analysis Applied Design for Innovation Curriculum

The objective of the NPS Defense Analysis Applied Design for Innovation curriculum (697) is to educate military personnel and civilian officials of the United States and its Allies to better defend the nation and prevent, prepare for, and prevail in conflicts by intentionally exploring, understanding, and attacking the problems posed by the future operating environment. This curriculum provides students with experiential learning around the challenges of innovation. Students will use a blend of design-thinking and analytic social science methods to engage in the problem-framing, ideation, creative collaboration, and stakeholder engagement necessary for successful innovation. This curriculum is designed to meet the changing needs of Naval Special Warfare in the context of rapidly changing technology and Great Power Competition. Students from the current 697 cohort were required to participate in this MGZ Warfare Innovation Workshop.

One of the co-leads of this curriculum reiterated that what the teams accomplished during this workshop was an interesting convergence of a couple different things on campus. First, the NPS DA Applied Design for Innovation curriculum, an AFSOC funded research Project Genghis looking at opportunities through China's belt and Road initiative to counter their unrestricted warfare, and then the NWSI Maritime Gray Zone (MGZ) Research Task Force (RTF).

APPENDIX A: Workshop Schedule

NWSI MARITIME GRAY ZONE WARFARE INNOVATION WORKSHOP

AGENDA as of 12 November 2021

Recorded sessions will be posted on the PREPARATION tab on Sakai

AUG 2021 (recorded)	**SEAPOWER CONVERSATION**	**Intermediate Force Capabilities**	**recording posted**	**LEIMBACH**
		Col Wendell Leimbach USMC, the Director of the Join Intermediate Force Capabilities Office reviews the relevance of IFCs within the National Defense Strategy.		
OCT 2021 (recorded)	**SYSTEMS ENGINEERING**	**Maritime Sabotage Impact Modeling**	**recording posted**	**PORTER**
		Dr. Wayne Porter reviews modeling done for NSW on the impacts of maritime sabotage		
TUE 9 NOV 1200-1300	**DISCOVERY SEMINAR**	**Crowd Dynamics Modeling Toolkit**	**Glasgow 109**	**BAYLOUNY & AROS**
		Dr. Anne Marie Baylouny reviews the modeling toolkit her team developed to predict crowd dynamics in response to a variety of stimuli	*recording posted*	
WED 10 NOV 1200-1300	**WORKSHOP INTRO**	**Overview & Tasking**	**Glasgow 109**	**HAYS & ENGLEHORN**
		CAPT Sean Hays USN gives an overview of the NWSI Maritime Gray Zone Research Task Force, and NWSI Concepts Branch Lead Lyla Englehorn shares the design challenge for the workshop and guidance on the workshop process	*recording posted*	
TUE 16 NOV				
0800-0930	**Discovery Discussion**	**"The Art of War" Analytic Wargaming**	**Glasgow 109**	**OCEA**

Time	Activity	Description	Location	Lead
0930-0945	Discovery Discussion	Mapping Gray Maritime Networks	Glasgow 109	SCHROEDER
0945-1000	*Process*	*a review of the plan to get this all done*	Glasgow 109	ENGLEHORN
1500-1600	DISCOVER -	synthesize data, determine what you still need	Root 109/111/113	
1600-1700	FRAME -	complete Discovery and create problem statements	Root 109/111/113	

WED 17 NOV

Time	Activity	Description	Location	Lead
0800-1000	IDEATE -	divergent, go for quantity!	Root 109/111/113	
1500-1700	Discovery Discussion	Offset Advantage & Peer Competition: *Omni-Domain Irregular Warfare*	Reed 201/202	TBD

THU 18 NOV

Time	Activity	Description	Location	Lead
0800-0900	IDEATE -	converge on an idea and develop it	Root 109/111/113	
0900-1000	PROTOTYPE -	create your first practice pitch	Root 109/111/113	
1500-1600	TEST -	pitch your idea, get feedback	Root 109/111/113	
1600-1700	REPEAT -	incorporate feedback -	Root 109/111/113	

> *is there more you need to know? Check your problem statement - does it still resonate? Go back to your data - is there something else you could use?*

FRI 19 NOV

Time	Activity	Description	Location	Lead
1400-1600	FINAL PRESENTATIONS		Glasgow 109	

Hybrid War of 2045: A force design scenario

2045 Political, Social, and Economic narrative:

Although the world's economic growth was severely arrested by the 2020 CORVID 19 pandemic, countries around the world began studying their own nation's economic fragility with a goal of investing in national capabilities to address the most vulnerable sectors. None more so than the United States. U.S. production industries received significant tax incentives to find reliable sources of metals, commodities, labor, and invest in additive manufacturing technologies. Service and food sectors were granted significant funds to enable additional resident work and home deliveries. The financial sector explored for risk associated with international investments and encouraged to focus on more domestic and regional development.

As other nations followed suit, regional trade blocks began to emerge with various degrees of unity. Lead by the United States, Mexico, Canada, and Brazil, the western hemisphere block is the most stable and near self-reliant. Yet, there are breakaways. Argentina aligns itself with the Asian block after China invested heavily in Argentine infrastructure between 2022 and 2040. The Indo-South East Asian block-- with India and Australia sharing leadership in economic cooperation-- includes Indonesia, the Philippines, Kenya, Singapore, Taiwan, Vietnam, Thailand, and Brunei. The African Union's 55 member states expanded their organization's activities and accelerated their Agenda 2063 resulting in improved economic cooperation, growth, and social programs across the continent.

Less stable is the Russian-European trade region with tensions existing between the oil supplier, Russia, and the oil consumers, the rest of Europe. The most fractious region is Asia, with competition between China and Japan for political, economic and military leadership intensifying daily. Japan maintains her strong relationship with the United States and the Western Hemisphere trade block, while China continues her political, fiscal, economic, and military expansionism: bridging the Eurasian trade regions through infrastructure investment between Asia and Europe under the "Belt and Road" program. In 2030 she began deploying forces along sea routes and at critical land junctions to provide security for these trade routes, which now include Arctic sea routes.

Although climate change has enabled Arctic sea route transits for all nations, other less desired effects have arisen including more frequent droughts, storms, heat waves, and droughts. These have resulted in crops and water scarcity in some trading blocks, while in others increasing levels of weather-related damage.

In 2045 China is the world's first economy, has a large and growing middle class population and consequently generates a higher demand for oil and natural gas, which she depends on Russia to provide. She has also achieved her goal of becoming a major space power, operating regular space flights to a Sino Space Station and servicing extensive satellite constellations. She is leading an international effort to go to Mars in 2046.

Various Force Locations for Great Power Competitors

China populated several islands terra-formed through dredging in 2015 with military installations. Fiery Cross Reef has a squadron of older manned J-20B fighters with 30 advanced GJ-11 (Sharp Sword) stealthy UCAVs and 10 WZ-8 supersonic reconnaissance UAVs. These aircraft work in manned-unmanned or unmanned teams. Fiery Reef, Mischief Reef, Gaven Reef, and Hughes Reefs have surface to air installations (S-600), [anti-surface DF-17 hypersonic glide vehicles](link) and the supersonic long range, high altitude DF-100 cruise missile, electronic surveillance and communication sites, and ship support facilities.

China also maintains an unmanned squadron and support vessel in Gwadar Pakistan. The squadron is composed of 15 GJ-11 (Sharp Swords), 10 HSU002 UUVs, and 20 advanced JARI USVs. These unmanned vessels exercise frequently with Chinese built Pakistan Type 055 destroyers stationed in Gwadar. China maintains six advanced Type 095 nuclear attack submarines, an advanced Type 004 aircraft carrier with 40 upgraded J-31 stealth fighters, four Xian KJ-600 AEW aircraft, and 40 stealth attack drones embarked; and five Type 52DL destroyers on patrol in the Indian Ocean, which frequently visit Gwadar, Yangon and Djibouti for logistics support.

As a show of "good will", China always deploys regularly outside of the Western Pacific and Indian Ocean to the Mediterranean, Argentina, and Cuba. These deployments are usually conducted by an older Type 003 aircraft carrier, two Type 55 destroyers, a Type 95 SSN, and two logistic support ships.

Russia has continued to build her undersea capabilities and has manned and unmanned forces stationed in the Arctic along the Northern Sea Route in locations like Murmansk, Alexandra Island, Kotelny Island, and Wrangle Island. From these bases Russia can threaten all the Arctic nations and the shipping route and defend her Arctic port and oil infrastructure. Forces and weapons include hypersonic anti-ship missiles, Poseidon 2M39 nuclear long range torpedo, land forces, and patrolling submarines.

Japan and the United States have strengthened their social, economic, and military ties in response to the growing influence of both China and Russia and instability in the Asian region. The Yokosuka naval facility is a joint JMSDF and United States Navy base. In Sasebo, the United States Navy retains expeditionary lift and logistics capability for both the U.S. Marine Corps and the Japan Maritime Defense Forces.

The United States maintains six Constellation Class Frigates in **Singapore**, an unmanned support squadron with 10,000 ton tender, and a variety of unmanned systems which are shared with the city-nation, including 6 advanced unmanned MMA patterned after the MQ-4 Triton. The United States now maintains logistic support bases in Diego Garcia and pre-positioned expeditionary supplies in Subic, with joint agreements with the U.K. and Philippines respectively. These bases can act as "rapid build-up" support bases if the host country agrees. Additionally, the Philippines have invited the United States Air Force to use Clark AFB as an expeditionary field, expanding its role beyond joint training exercises. The United States Air Force has retained Kadena AFB on Okinawa, and III MEF occupies the air base in Henoko village. In addition, a U.S. Marine rotational force is in **Darwin, Australia**.

Australia has built up their air and naval forces with the intent of closer cooperation with the United States. For example, 12 Shortfin Barracuda SSKs are operational and the RAAF operates 15 MMA P-8 Advanced Aircraft and 9 MQ-4D Triton from Edinburgh conducting frequent bi-lateral exercises with the United States and other countries from the Western hemisphere and Indo-South East Asian trade blocks.

Increasing Tensions Globally

South Atlantic: In 2042, bolstered by China's funding and desire to control the Strait of Magellan traffic, **Argentina** challenges the Beagle Island claims by Chile and revokes the 1984 treaty which gave control of the islands and Straits to Chile. Argentina closes all her western boarders and stops all maritime traffic exiting or entering the Strait of Magellan. China immediately supports Argentina's claim and warns the United States to remain neutral in this local dispute. To ensure the United States neutrality, China moves a deployed naval task group to Puerto de Buenos Aires and warns the United States to keep her forces north of the equator. Russia aligns and supports China declarations and threatens to deploy her Northern fleet into the Atlantic to ensure United States compliance. She also threatens to close all Northern Sea Route traffic heading for United States ports.

South China Sea: While the United States population focuses on the Chile/Argentine dispute, and surprised by China's and Russia's response, China publicly extends her South China Sea Claims to 1 degree north with the justification to protect critical fishing grounds, undersea resources and trade routes into China.   She offers to buy or lease the Island of Natuna Basar from Indonesia to establish maritime security forces to be a "sentry" for peace, trade, and fishing in the southern seas. There is a less than vailed threat that should Indonesia fail to accept this offer, China will blockade then invade Natuna Basar as is her right as a guarantee of open trade.

Baltic: While increasing tensions in the Pacific and Southern Atlantic have the attention of the United States and Europe, several media statements released by Russian leaders indicate re-establishing the historical Russian influence in the Baltic Sea. Swedish intelligence has found evidence that Russia is making plans to project its power by taking over the Swedish island of Gotland, a territory Russia claims as part their heritage. Controlling Gotland will give them significantly more port space within the Baltic; achieve greater situational awareness of the maritime approaches to Stockholm, St Petersburg, Tallinn, Riga, Kaliningrad and Gdansk; and further project their control over shipping and natural resources in the Baltic Sea. Taking Gotland will also give Russia a good indication of how other countries will respond to their expansionist intentions without the risk of a costly war. Specifically, they are interested with the United States' will to support Sweden and its ability to mobilize and stop the island occupation. Due to cramped naval installations at St. Petersburg, the Russian Baltic naval strength is relatively small, and they do not wish to use the time, or give away their intentions, by employing their Northern Fleet to assist in this operation--except for submarines in coordination with their threat to the United States to remain neutral in the Argentine/Chile dispute. Five Sererondvinsk (Yasen) class SSNs, 2 Belgorod SSGN, and 3 older Lada Class SSK are detected to be underway from the Northern Fleet ports and believed to be headed for either the Atlantic or Arctic.

Upon discovering this plan, Swedish authorities have notified the United States and other Baltic nations and asked for their assistance. While the UN is not officially notified, word has spread and Russian representatives at the UN are vehemently denying such an operation is being planned. However, the United States, in cooperation with Swedish and British intelligence, has good indication that not only is this plan in place, but the attack is imminent. Other Baltic countries have agreed to allow United States over flight rights to ensure Gotland's security, but have not yet made commitments of force. Finland, however, has indicated they will come to the aid of Sweden.

Indian Ocean: Emboldened and supported by China, Pakistan begins naval and land patrols near Sir Creek to support their claim of the eastern shore dividing line with India. India has long claimed a center-line division. Although a minor dispute compared to the larger territorial confrontations of Jammu and Kashmir, the Indian Navy takes this challenge seriously and begins to deploy their surface forces. Ship to ship shouldering becomes a common occurrence and warning shots are exchanged. China threatens that if India does not stop her deployments, she will conduct an extended blockade against Indian trade by intercepting ships transiting the Suez and Malacca straits. India calls upon her trading partner Australia for possible support. The United States, Singapore, Japan, and England publicly denounces China's threat and lend their diplomatic support to India and Australia.

The United States, her allies and trading partners, now look for responses to deter further aggression, and if necessary, deploy forces for combat.
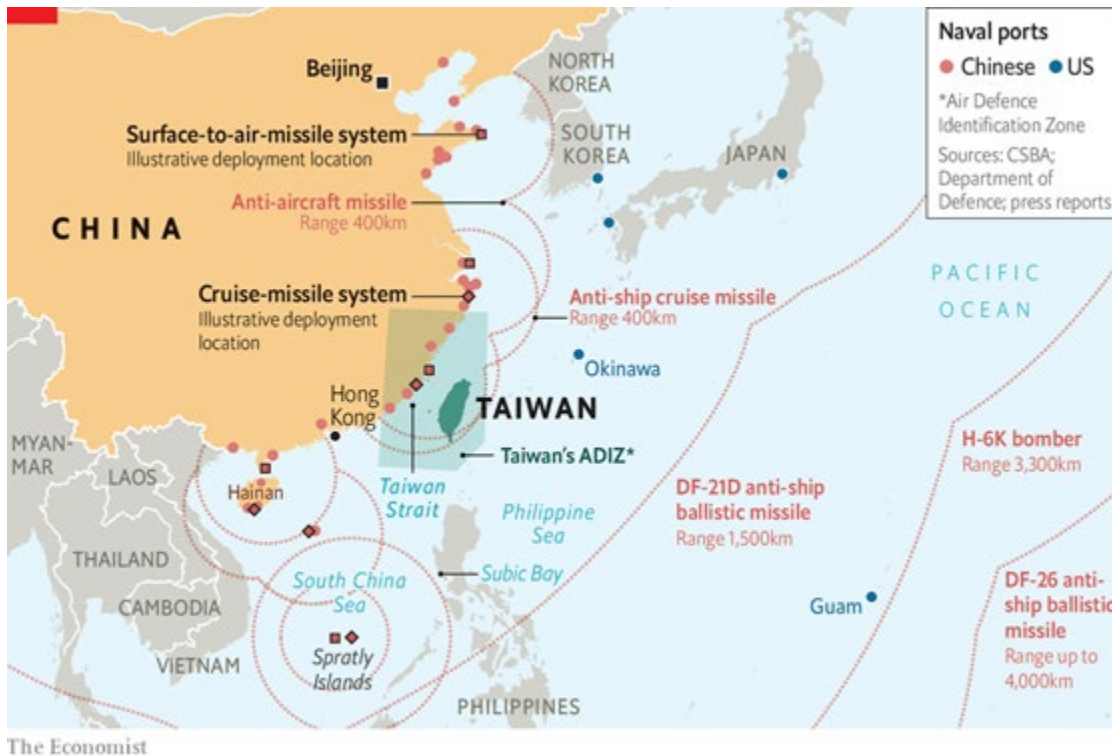
All Data on platforms and weapon systems have been derived from unclassified sources (Janes IHS, USNI publications, and websites.) Request for information may be addressed to Prof. Jeff Kline at jekline@nps.edu