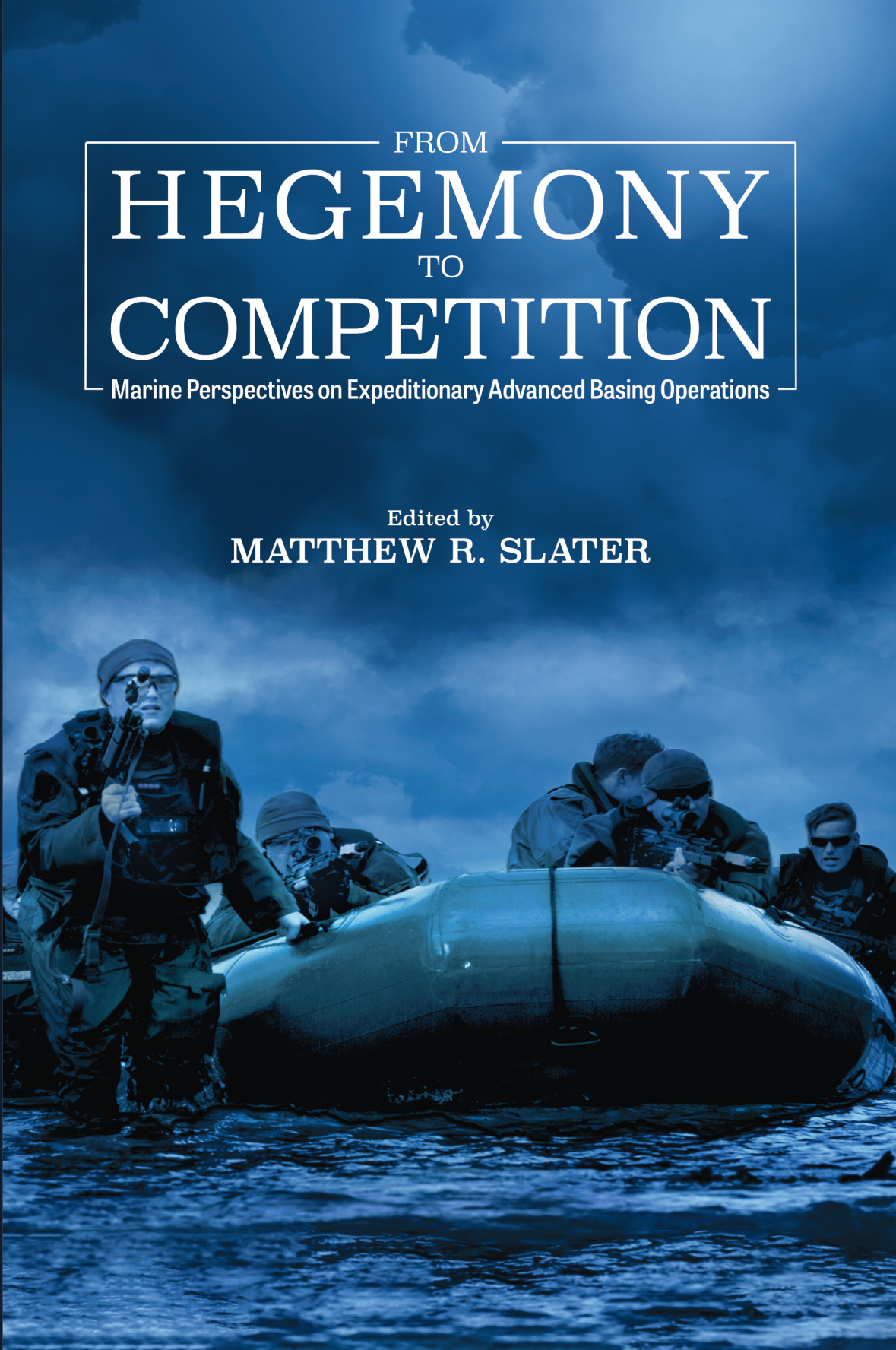
FROM HEGEMONY TO COMPETITION

Marine Perspectives on Expeditionary Advanced Basing Operations

Edited by

MATTHEW R. SLATER



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FOREWORD

One of the pleasures of teaching at an institution for professional military education is watching some of the world's finest officers tackle the most challenging problems their nations face. For nearly a decade, I have studied and taught at Marine Corps University (MCU) in its Command and Staff College and School of Advanced Warfighting (SAW) in Quantico, Virginia. At both schools, field-grade leaders grapple with vexing institutional and operational issues in a bid to exploit opportunities and overcome obstacles. The writing that officers do in these courses sometimes bears significant fruit in the operating forces, as it did for one student and, later, a SAW director, whose research on Rhodesian and South African successes in tactical vehicle design eventually led to the introduction of the Mine Resistant, Ambush-Protected (MRAP) truck program in the United States. Another officer translated the concept of punitive raids, explored in a student comprehensive examination, to the employment of a Marine Expeditionary Unit-based battle group that senior leaders dispatched to fight Islamic State insurgents in Syria.

In that spirit of applicatory education, Matthew R. Slater showcases recent student papers examining the Marine Corps's concept of expeditionary advanced base operations (EABO).[1] The man, the moment, and the mission are well matched. Slater currently develops curriculum for the FBI Academy. He was previously an instructor at the MCU's Command and Staff College and published earlier volumes on Russia and strategic culture with MCU Press. Working with faculty at the Command and Staff College and SAW, Slater assembled a group of essays that address some of the most innovative EABO ideas students developed during the 2020–21 academic year. Of the numerous papers written in that time, eight emerged from this winnowing process. Flag officers routinely tell majors and lieutenant commanders that the Joint force needs them to study and solve the problems inherent in emerging operational concepts or to debunk those ideas entirely. These papers meet that challenge by examining EABO, one of the most important concepts associated with the controversial Force Design 2030 initiative.[2] From an institutional perspective, nothing could be more relevant or timely.

The authors in these pages, former students who answered the call to think, research, and write about EABO, are an eclectic lot. They include infantry, engineers, logisticians, a pilot, and an intelligence officer. Collectively, these authors—all Marine Corps officers—represent more than 120 years of commissioned service. They stand at the midpoint in their professional careers, bringing an impressive mix of talent and experience to the problems they explore. Each officer selected their project, developed a research plan, surveyed existing literature, coordinated with subject matter experts, followed evidence to logical conclusions, vetted their methods and recommendations

[1] *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: Headquarters Marine Corps, 2021).
[2] *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2020).

with faculty and fellow students, and edited multiple paper drafts. Their essays either validate or undermine existing and emerging concepts, doctrine, and practices. Regardless, this largely self-directed educational process stimulates their creativity, hones professional judgment, and develops reflective practitioners.

The authors examine EABO from a variety of perspectives. They analyze logistic constraints, connectivity requirements, connections to previous doctrinal concepts, interagency cooperation opportunities, potential actions below the threshold of armed conflict, ways in which EABO may support European allies, and force design options to increase Marine Corps reconnaissance and maritime maneuver and strike capabilities. Consistent themes emerge, foremost among them being flexibility, interoperability, lethality, survivability, and sustainment. Implicitly, these concerns suggest important questions about if, when, and how new doctrine becomes too specialized to survive contact with unexpected conditions in an evolving operational environment.

Will EABO represent a momentary enthusiasm, like *Operational Maneuver from the Sea*, overcome by the laws of physics and the rising tides of a different kind of war? Or will it provide, like the *Tentative Landing Manual*, nascent capabilities that the Joint force will one day exploit to win a global conflict against a peer competitor?[3] Time will tell. In the meantime, recommendations, such as those offered in this volume by Lieutenant Colonel Thomas E. Driscoll, who calls for small boats delivering improved tactical mobility and more lethal fires in support of ground forces operating in the littoral, will help the Service consider branches and sequels to its initial EABO ideas. Such proposals are reminders that there is more than one way to conceptualize and conduct advanced base operations.

These essays underscore the legacy of innovation that has long marked the Marine Corps. During the past century, this small naval Service has developed, for example, the *Small Wars Manual*, amphibious doctrine, vertical envelopment techniques, Combined Action Platoons, the Chemical Biological Incident Response Force, maritime prepositioning squadrons, and tilt-rotor aircraft.[4] In challenging and refining the EABO concept, these authors follow in the footsteps of previous generations of Marines, who wrote while stationed in schools or in the fleet and who imagined and perfected new warfighting capabilities.

From Hegemony to Competition also highlights the strong partnership between MCU and the Warfighting Lab in Quantico, where Slater served when this project commenced. The Command and Staff College's Gray Scholars program has collaborated with the Warfighting Lab's Ellis Group several times during the past few years.

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[3] *Operational Maneuver from the Sea*, Marine Corps Concept Publication 1 (Washington, DC: Headquarters Marine Corps, 1996); and *Tentative Manual for Landing Operations, 1934*, Historical Amphibious File 39, COLL/3634, Marine Corps History Division, Quantico, VA.

[4] *Small Wars Manual*, Fleet Marine Force Reference Publication 12-15 (Washington, DC: Headquarters Marine Corps, 1990); Keith B. Bickel, *Mars Learning: The Marine Corps' Development of Small Wars Doctrine, 1915–1940* (Boulder, CO: Westview Press, 2001).

Together, they developed simulations to test various amphibious applications.[5] Last spring, the SAW class created three new wargames that examined aspects of employing Marine Littoral Regiments.[6] This synergy between field-grade officer students at MCU schools and the Commandant's lead agency for testing new warfighting initiatives consistently yields productive insights for participants in both camps. The practical outcomes of the coordination sometimes lead to enhanced capabilities like the MRAPs and Marine flying columns mentioned above. Always, of course, such innovation depends on men and women with the drive, vision, and courage to advance new (and sometimes recycle old) ideas. The schools and the Warfighting Lab strive to generate and empower such leaders. In the words of Lieutenant General James C. Breckinridge, who directed Marine Corps schools almost a century ago, these officers are "trained to reason briefly, clearly, decisively, and sanely."[7] This volume indicates that tradition lives on.

Michael F. Morris
Associate Professor of Military History
School of Advanced Warfighting, Marine Corps University

[5] Benjamin Jensen, "Diverging from the Arbitrary: The Gray Scholars and Innovation in the U.S. Marine Corps," *War on the Rocks*, 1 August 2018.
[6] Benjamin Jensen and Michael Rountree, "Driving the Dark Road to the Future: A Guide to Revitalizing Defense Planning and Strategic Analysis," *War on the Rocks*, 1 July 2022.
[7] Col J. C. Breckinridge, USMC, "Some Thoughts on Service Schools," *Marine Corps Gazette* 14, no. 4 (December 1929): 238.

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I deeply appreciate the effort of the staff at MCU Press in helping to organize and edit this book over the last year. I also would like to thank former colleagues at the Marine Corps Warfighting Lab who provided support and helpful comments. Michael Morris from the Marine Corps University's School of Advanced Warfighting was instrumental in recommending student papers for this volume.

ABBREVIATIONS AND ACRONYMS

A2/AD—antiaccess/area-denial
AAFO—amphibious advance force operations
ABDA—American-British-Dutch-Australian Command
ALES—Amphibious Leaders Expeditionary Symposium
APG—airborne power generators
ARG—amphibious ready groups
AWG—atmospheric water generators
BRI—Belt and Road Initiative
BSR—Baltic Sea region
BTU—British thermal units
C2—command and control
C4ISR—command, control, communications, computers, intelligence, surveillance, and reconnaissance
CAA—combined arms army
CBRN—chemical, biological, radiological, and nuclear
CCIR—commander's critical information requirements
CDRTSOC—commander, Theater Special Operations Command
CJTF—Combine Joint Task Force
CLC2S—Common Logistics Command and Control System
COC—combat operations center
COTS—commercial off-the-shelf
CPG—*Commandant's Planning Guidance*
CRFP—Crisis Response Force Package
CSG—Carrier Strike Group
CSL—cooperative security locations
DEUCSI—Defense Experimentation Using Commercial Space Internet
DMO—distributed maritime operations
DOD—Department of Defense
DOTMLPF-P—doctrine, organizational, training, materiel, leadership, personnel, facilities, and policy
E2O—Expeditionary Energy Office
EAB—expeditionary advanced base
EABO—expeditionary advanced base operations
ECU—environmental control units
EM—electromagnetic
FEO—forcible entry operations
FIC—first island chain

FOC—full operational capability
G-BOSS—ground-based operational surveillance systems
GIUK—Greenland–Iceland–United Kingdom Gap
GREENS—Ground Renewable Expeditionary Energy Network System
GCSS-MC—Global Combat Support System-Marine Corps
GEO—geosynchronous earth orbit
ISR—intelligence, surveillance, and reconnaissance
IWPS—individual water purification system
JAM-GC—Joint Concept for Access and Maneuver in the Global Commons
JFMCC—Joint Force Maritime Component Commands
JIE—Joint Information Environment
LAAB—Littoral Antiair Battalion
LCT—Littoral Combat Team
LEO—low earth orbit
LLB—Littoral Logistics Battalion
LMF—Littoral Maneuver Force
LOCE—littoral operations in a contested environment
LWPS—lightweight water purification system
MAGTF—Marine Air-Ground Task Force
MARSOC—Marine Forces Special Operations Command
MCEN—Marine Corps Enterprise Network
MCPP-N—Marine Corps Prepositioning Program-Norway
MCTSSA—Marine Corps Tactical Systems Support Activity
MCWL—Marine Corps Warfighting Laboratory
MEB—Marine Expeditionary Brigade
MEF—Marine Expeditionary Force
MEFEX—Marine Expeditionary Force Exercise
MEU—Marine Expeditionary Unit
MID—Militarized Interstate Dispute
MLG—Marine Logistics Group
MLR—Marine Littoral Regiment
MOF—metal-organic framework
MPF—Maritime Prepositioning Force
MPSRON—Maritime Prepositioning Ships Squadron
MUOS—Mobile User Objective System
NALMEB—Norwegian Air-landed Marine Expeditionary Brigade
NATO—North Atlantic Treaty Organization
NCA—national command authority

NMCI—Navy-Marine Corps Intranet
NOBLE—Naval Operational Business Logistics Enterprise
NOSS—Naval Operational Supply System
NSWC—Naval Surface Warfare Center
OCS—operational contract support
OPE—operational preparation of the environment
PLA—People's Liberation Army
pLEO—proliferated low earth orbit
PMSC—private military security companies
PRC—People's Republic of China
PWPS—platoon water purification system
RDF—rapid deployment force
SATCOM—satellite communication
SEATO—Southeast Asia Treaty Organization
SIF—stand-in forces
SOF—special operations forces
SPACES—Solar Portable Alternative Communication Energy System
SUWPS—small unit water purification system
SWPS—squad water purification system
TAMCN—Table of Authorized Material Control Numbers
TCPT—Transportation Capacity Planning Tool
TWPS—tactical water purification system
UAS—unmanned aircraft systems
UAV—unmanned aerial vehicle
U-LEPS—ultra-lightweight expeditionary power system
USAID—U.S. Agency for International Development
USEUCOM—U.S. European Command
USINDOPACOM—U.S. Indo-Pacific Command
USTRANSCOM—U.S. Transportation Command
WEZ—weapons engagement zone

FROM HEGEMONY TO COMPETITION

Introduction

The Challenge of Change

Matthew R. Slater, PhD

History shows that warfighting organizations adapt slowly to change, and the larger and more complex the change, the greater the task to adapt. The efforts of the U.S. Marine Corps to adjust to expeditionary advanced base operations (EABO) represent a significant modification to how the Service has been fighting since the end of the Cold War. However, this alteration is not a one-dimensional challenge: change is attacking from many fronts. The Marine Corps is adapting to a new adversary, new geography, new partnerships, new tactics, and rapidly evolving technology. A decision maker may be tempted to take a conservative approach due to the layered complexity of the task. An overinvestment in one weapons program, for instance, could set back the effort to deter adversaries for years. To embrace this complex change, the Marine Corps has laid out a plan of rapid capability development, beginning with concepts, testing, prototyping, and employment.[1] Marine personnel are rising to the challenge by providing insights, critiques, and leadership that allows the Service to acclimate to new challenges at the quickest pace possible.

This collection of essays is based on student papers from the academic year 2021–22 written at Marine Corps University's Command and Staff College and School for Advanced Warfighting during this period of dynamic change. This volume provides the reader with a glimpse into how seasoned Marine Corps officers are grappling with the most significant transformation since World War II. The Commandant tasks them to adapt to new adversaries, adjust to an innovative warfighting philosophy, and understand rapidly evolving technologies.

The contributors to this volume started their Marine Corps careers during Operations Enduring Freedom (2001–14) and Iraqi Freedom (2003–11) and were shaped by the predominance of the counterterrorism mission. The culture change demanded by EABO profoundly affects these Marine leaders. They do not have the advantage of moving up through the ranks while learning from a consistent operational concept. By comparison, several generations of officers witnessed relative constancy during the 50 years of the Cold War era. The challenge of EABO is unique to their age because they are expected to reevaluate their accumulated experience rather than rely on it as an indicator of future contingencies as well as examine all assumptions in a new light. In short, the Marine Corps is asking them to reinvent a good deal of their training and education to accommodate a new way

[1] *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2022).

of warfighting. This compilation demonstrates their energy and willingness to take on this uniquely challenging task.

From Hegemony to EABO

The United States enjoyed two decades of global hegemony spanning from the end of the Cold War until the emergence of an antagonistic China and Russia. During the brief reign of supremacy, the goal of American statecraft was to maintain the status quo. International relations theory states that hegemonic systems are marked by fleeting systemic stability—brief because competing states work together to balance against the hegemon and stable because of the lack of competition to influence global economic and political systems. China's rise in power did not surprise the United States completely. In 2011, U.S. policy generated an economic, diplomatic, and military strategy articulated as a "pivot to Asia."[2] Shortly after the administration of President Barack H. Obama announced this policy change, the Marine Corps deployed 2,500 personnel to Australia for a military exercise that China criticized. This action and response effectively marks the beginning of the standoff between the United States and China in the South Pacific that shows no signs of abating a decade later.

While Chinese ascendance was initially measured and understated, it is now inundating and confident. In 2015, the United States warned China regarding its prolific construction at Mischief Reef, a low-tide atoll in the South Pacific that they first claimed control over in 1994. Undeterred by U.S. warnings about further development and conflicting territorial claims by the Philippines, China spread its construction efforts to another half-dozen reefs.[3] By 2017, China established bases of varying sizes on nearby Fiery Cross, Mischief, and Subi reefs as well as on North, Triton, and Woody islands in the Paracel Islands.[4] These stations offer the People's Republic of China (PRC) greater control over a region where one-third of global commerce passes through and a basis for territorial claims where known hydrocarbon resources exist.[5] The PRC has established overlapping sensing capabilities and based fighters, bombers, antiaircraft, antiship, and cruise missile systems on the reefs, which enable reconnaissance and provide a permanent presence to intimidate regional states.[6] To this end, China also placed oil drilling rigs in territory claimed by Vietnam and employed economic and diplomatic pressure to force neighboring states to bend to their territorial claims in the South Pacific. Using its notorious

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[2] Kenneth G. Lieberthal, "The American Pivot to Asia," Brookings, 21 December 2011.
[3] Greg Torode and Manuel Mogato, "Caught Between a Reef and a Hard Place, Manila's South China Sea Victory Run Aground," Reuters, 14 July 2016.
[4] "A Constructive Year for Chinese Base Building," Asia Maritime Transparency Initiative, 14 December 2017.
[5] Hannah Beech, "China's Sea Control Is a Done Deal, 'Short of War with the U.S.'," *New York Times*, 20 September 2018.
[6] Sensing capabilities include mobile, fixed, or space-based sensors capable of picking up emissions in the electromagnetic spectrum, or acoustic signals.

debt-trap diplomacy, China is rapidly developing port facilities in the Pacific Islands in Asua and Vaiusu.[7]

Chinese military strategy morphed to match the Chinese Communist Party's growing foreign ambitions. China must defeat U.S. military forces in the South Pacific to control essential trade routes autonomously. In support of this goal, the PRC generated an impressive antiaccess/area-denial (A2/AD) strategy that is composed of sensors in the South Pacific, long-range precision missiles, cruise missiles, and soon hypersonic missiles that can destroy land and sea-based targets while being protected on the Chinese mainland. Analysts believe that the recent island and reef construction is meant to reinforce sensing capabilities that augment the A2/AD force by providing "eyes" to direct strike assets on the mainland.[8]

The Marine Corps Response

The 2018 *Commandant's Planning Guidance* was released in sync with that year's *National Defense Strategy*, which had one of the stated goals of focusing defense efforts on actively blocking Russian and Chinese challenges. In response, the *Commandant's Planning Guidance* outlined significant changes in organization, tactics, and capabilities by affirming that "the Marine Corps is not organized, trained, equipped, or postured to meet the demands of the rapidly evolving future operating environment."[9] From this foundation, Marine Corps leadership discussed far-reaching modifications to force design, warfighting, and associated education and training to address the Service's shortcomings.

The sudden shift from a counterinsurgency mission in the Middle East to peer competition in the South Pacific elicited reactions across the Marine Corps and the Department of Defense. Table 1 summarizes the planned additions and subtractions to the force structure to be completed by 2030, capturing the scale of change on the horizon.[10]

Significant changes to any organization are controversial, and this case is no different. One critical report from the Center for Strategic and International Studies expressed concerns about eliminating force structures and platforms that enable the Marine Corps

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[7] Jonathan Barrett, "Samoa's Disputed Leader Promises Chinese-Backed Port at a Third of the Cost," Reuters, 9 June 2021; and "Samoa Wants China to Help Build Asau Port," Talanei.com, 28 October 2020. For more on China's predatory loan practices, see Mark Green, "China's Debt Diplomacy: How Belt and Road Threatens Countries' Ability to Achieve Self-Reliance," *Foreign Policy*, 25 April 2019.

[8] "World War III: How Chinese Missiles Could Overwhelm the U.S. Military," *National Interest*, 11 March 2021.

[9] Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2018), 1.

[10] Table 1 is recreated from, Michael R. Gordon, "Marines Plan to Retool to Meet China Threat," *Wall Street Journal*, 22 March 2020.

Table 1. Marine Corps force structure plan comparison

	Current inventory	2030	Increase/decrease
Unmanned aircraft squadrons	3	6	+3
Missile/rocket batteries	7	21	+14
C-130 aircraft squadrons	2	4	+1
Fighter/attack aircraft squadrons	18	18	0
Cannon batteries	21	5	-16
Tank companies	7	0	-7
Bridging companies	3	0	-3
Infantry battalions	24	21	-3
Tilt-rotor aircraft squadrons	17	14	-3
Helicopter attack squadrons	7	5	-2
Helicopter heavy lift squadrons	8	5	-3

Source: Michael R. Gordon, "Marines Plan to Retool to Meet China Threat," *Wall Street Journal*, 22 March 2020.

to execute counterinsurgency and close-quarter combat against other armies.[11] Some analysts worry that conventional conflict is unlikely because peer competitors will more likely compete through proxies. If a future conflict does not unfold as U.S. planners believe, then the Marine Corps could be trading force resiliency—the capacity to fight across the range of operations—for one specific mission.[12]

In conjunction with the *Commandant's Planning Guidance* in 2018, the Marine Corps published four central guides—*Expeditionary Advanced Base Operations (EABO) Handbook*, *Force Design 2030*, *Tentative Manual for Expeditionary Advanced Base Operations*, and *A Concept for Stand-in Forces*—that describe the philosophy and tactics involving distributed operations with reconnaissance capabilities supported by low signatures, small logistical footprints, and advanced command and control capabilities.[13] Due to the holistic change that EABO represents across doctrine, organization, training, materiel,

[11] Mark F. Cancian, "The Marine Corps' Radical Shift toward China," Center for Strategic and International Studies, 25 March 2020.
[12] See Tanner Greer, "The Tip of the American Military Spear is Being Blunted," *Foreign Policy*, 6 July 2020; and, Mark F. Cancian, *U.S. Military Forces in FY 2021: Marine Corps* (Washington, DC: Center for Strategic and International Studies, 2020), 10.
[13] Art Corbett, *Expeditionary Advanced Base Operations Handbook: Considerations for Force Development and Employment* (Quantico, VA: U.S. Marine Corps Warfighting Lab, 2018); *Force Design 2030*; *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: Headquarters Marine Corps, 2021); and *A Concept for Stand-in Forces* (Washington, DC: Headquarters Marine Corps, 2021).

leadership, personnel, and facilities, the concept became a common theme for conversations across the Marine Corps. Well-read periodicals, such as the *Marine Corps Times*, *Marine Corps Gazette*, and U.S. Naval Institute *Proceedings*, published articles debating the multitude of changes required to execute EABO. At the outset, the deliberations challenged the far-sweeping modifications recommended in the *Commandant's Planning Guidance* and, later, discussed logistics, command and control, and other changes to fill out the *Force Design 2030* framework.

It is not a surprise that the various schools of Marine Corps University (MCU) have focused on the layered challenges that the implementation of EABO poses. Faculty at MCU infused their history, international relations, and future force seminars with EABO-related topics. Students were able to leverage expertise at the Marine Corps Warfighting Lab, the center of EABO development, which physically moved to a location co-located with the main MCU campus in time for the beginning of the 2020–21 academic year.

Preview of Research Papers

The essays in this volume introduce and explore the issues that the Marine Corps, as well as the U.S. military more generally, faces in implementing EABO. The first three chapters address various logistical challenges associated with distributed operations in austere environments. Major Stafford A. Buchanan points out that future battlefields will be proliferated with sensors encouraging the reduction in "iron mountains" that typically supply current operational forces. Because fuel and water compose a large percentage of a detachment's total logistical burden, units will need to exploit technologies that allow them to reduce fuel consumption and find water supply alternatives. Taking these steps, Buchanan points out, promises to make battlefield elements more autonomous and presents a realistic assessment of their strengths and weaknesses.

Major Gloria C. Luedtke asserts that EABO calls for a robust command-and-control capability to allow less fixed logistics bases in the weapons engagement zone (WEZ). She reasons that although distributed Marine units require greater connectivity to allow adequate logistics support, EABO calls for less infrastructure, creating a dilemma that the Corps must resolve. Luedtke contends that low earth orbit (LEO) satellite technology is the likely solution. Many private companies, such as SpaceX, Amazon, and OneWeb, are busy planning the launch and operation of LEO constellations. China is following their lead and announced it would build a constellation of 13,000 satellites to provide a national internet network. However, analysts are aware of its potential military use.

Major Nicholas S. Lybeck takes a strategic approach to EABO logistics. He focuses on the difficulty of operating in a region far from the United States, compounded by the inability to manage logistics from fixed facilities inside the WEZ. Lybeck provides a short history of the seabasing concept—the conditions that gave rise to the basis for the current Maritime Prepositioning Force (MPF). He also ex-

plains that fixed facilities associated with MPF cannot support EABO forces in the weapons engagement zone, requiring the units to find substitutes. He illustrates that the United States must reach out to regional allies to increase economic and military interoperability to strengthen the infrastructure support for seabasing operations.

Major Marianne C. Sparklin's contribution agrees with Lybeck's call for multilevel cooperation with allies but focuses solely on the value of diplomacy. Her chapter discusses the importance of collaboration between the United States and its allies for EABO to succeed in the first island chain. China depends on its ability to economically and politically dominate regional states, allowing the Chinese Communist Party to integrate them into its military planning. By contrast, the United States is dependent on cooperation between independent sovereign states—a far more complex task. Although acknowledging the difficulty of interstate cooperation, Sparklin argues that the benefits will contribute to a multifaceted approach to dealing with China and not only reliant on military confrontation.

Major Matthew R. Hart argues that Marine Corps reconnaissance units should play a key role in countering China's multidomain kill chain capability. He writes that current reconnaissance and intelligence communities can execute EABO-like missions, but they are not employed as self-reliant and task-oriented units. Hart suggests that the Marine Corps establish a standing Fleet Marine Force reconnaissance unit to reinforce intelligence and surveillance. This will enable EABO by increasing the likelihood of finding, identifying, and engaging adversary targets.

Major Kendall J. Ignatz's addition takes the macro view of the U.S. Indo-Pacific Command area of operations, examining the notion that the United States is unable to invest in both armed conflict and gray zone conflict simultaneously. He asserts that the U.S. military is busy eschewing gray zone conflict as a fashion of the past, investing significant resources on the opposite side of the conflict spectrum instead. Ignatz questions if this is a wise choice due to how China thrives in the gray zone. What good is it to prepare for armed conflict if China wins before the first shot? As part of a layered argument, Ignatz explores if the United States's ability to fully invest in armed conflict will undermine its ability to fight in other areas of the conflict continuum.

The last two student contributions to this volume come from officers who attended the School of Advanced Warfighting (SAW) during the previous academic year (2020–21). All three chapters focus on an assignment that requested them to identify and address a warfighting problem or opportunity that may occur in the next 15–20 years.

The EABO concept is oriented toward the Indo-Pacific region. Lieutenant Colonel Thomas E. Driscoll considers EABO warfighting principles and applies them to the northern European theater. Based on his review of recent Russian conflicts against Georgia and Ukraine, Driscoll proposes creating a Littoral Maneuver Force with an organic flotilla that provides fire support to ground maneuver elements. This

adaptation to EABO creates a seamless ground-naval response to adversaries and significantly boosts the close-in fight around urban littorals.

Major Alexander T. Luedtke notes that assessments predict Russian gains on the North Atlantic Treaty Organization's (NATO) northern flank if the Marine Corps does not alter its current strategy in the region. He provides the reader with a brief history of Russian behavior since the end of World War II as a means to project mid- and far-term state behavior. By comparing NATO's current posture in the European Arctic with likely Russian responses, Luedtke provides conclusions regarding the appropriate role for the Marine Corps in alignment with other U.S. Services and partner countries.

Chapter 1

Self-Sustaining Warriors in Expeditionary Advanced Base Operations

Major Stafford A. Buchanan, USMC

In his opus *On War*, Prussian military theorist Carl von Clausewitz wrote that the nature of war remains the same, but it is the ever-changing character of war that determines how it is fought.[1] Simply put, war is, and always will be, a struggle of wills. Due to improvements in technology, modern conflicts will continue to unfold in novel and unpredictable ways. Militaries try to anticipate the evolving character of war, identify emerging technologies and concepts that will define the future battlespace, and grow to maintain the competitive advantage.

In recent years, the proliferation of effective antiaccess/area-denial (A2/AD) technologies caused an identity crisis within the U.S. Navy and Marine Corps. Senior leaders began to understand that long-held assumptions about the U.S. military's ability to readily dominate and control sea and airspace anywhere in the world were no longer absolute, realizing that the United States could no longer rely on its current capabilities and doctrine to do so. These A2/AD systems, composed of long-range, land-based missiles and capable sensors or radars, require increased standoff for naval forces and make conducting forcible entry operations against such threats extremely hazardous endeavors.

At the beginning of the twenty-first century, Russia, China, and Iran began developing and refining their A2/AD capabilities while the United States, immersed in two land wars in the Middle East, focused on counterinsurgency and counterterrorism. After nine years at war, the United States understood that with China's rise, a new era of great power competition was on the horizon. Since the publication of the *Quadrennial Defense Review* and the policy document *Pivot to the Pacific* during the presidency of Barack H. Obama, U.S. policymakers identified developing a strategy against the A2/AD threat as a national priority.[2] In response, the U.S. Navy and Marine Corps conceived several nested military concepts—distributed maritime operations (DMO), littoral operations in a contested environment (LOCE), and expeditionary advanced base operations (EABO). These models required the Marine Corps to create an *inside force*—small teams that are difficult to find yet highly capable and meant to operate in austere environments—distributed throughout an enemy's weapons en-

[1] Carl von Clausewitz, *On War*, ed. and trans. Michael Eliot Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976; reprint, 1989), 86–89.
[2] *Quadrennial Defense Review Report* (Washington, DC: U.S. Department of Defense, 2010), xiv; and Mark E. Manyin et al., *Pivot to the Pacific?: The Obama Administration's "Rebalancing" Toward Asia* (Washington, DC: Congressional Research Service, 2012), 1.

gagement zone (WEZ) to establish EABOs. Being able to hide from enemy sensors while also sensing and targeting enemy platforms, the *inside force* aims to provide the *outside force*—vulnerable but highly capable legacy systems and platforms such as the conventional U.S. naval fleet—greater sea control and maneuver space and to deny the adversary the same.

The logistical sustainment of these small teams operating deep within the enemy's WEZ creates a problem for the Navy and Marines. In comments made at the U.S. Marine Corps Hybrid Logistics Symposium in 2018, Lieutenant General Michael G. Dana stated that "70 to 80 percent of all military logistics is the transportation of water and fuel."[3] Recent academic studies also indicate that about 1 servicemember dies in every 20 convoys.[4] If this holds true, the Navy's regular resupply of these forces deep within the WEZ will increasingly endanger forthcoming missions. The Marine Corps's success in future EABOs inside the enemy WEZ will hinge on the inside forces reducing its reliance on long logistics chains. The United States cannot expect to win the next war using logistics, technology, and doctrine developed to fight the previous war. By analyzing the current threat environment and taking stock of the limitations of the current water and power capabilities of the Marine Corps, it becomes increasingly evident that change is required. To increase the Navy's capacity to conduct EABO in the U.S. Indo-Pacific Command's (USINDOPACOM) area of responsibility, the Marine Corps must reduce its reliance on long logistics chains for sustainment. Specifically, the Corps must pursue promising, emerging technologies that are scalable and rely on renewable energy to enable Marines at the lowest levels to self-sustain in power and water production.

The Changing Battlefield

As the battlefield changes, so should the military's approach to it. The authors of the DMO, LOCE, and EABO concepts recognized the paradigm shift in naval warfare that the A2/AD threat presented as well as the equally drastic alteration in doctrine and capabilities needed to meet the danger. These ideas also justify both funding from the U.S. Congress and prioritization by senior military leaders and Service secretaries. Fortunately, DMO, LOCE, and EABO all gained traction during the first year of General David H. Berger's term as Commandant of the U.S. Marine Corps. As observed in the 38th *Commandant's Planning Guidance* (CPG) published in 2019 and the resulting *Force Design 2030* published in 2020, the Marine Corps took significant steps toward reshaping itself to better counter the A2/AD threat.[5] These constructs

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[3] Capt Dylan F. Metzler, "Logistics in the Contact Layer: Supporting a Mini-'MAGTF'," *Marine Corps Gazette* 103, no. 5 (May 2019): WE22.
[4] Sean C. Flores, "Pulling Water Out of Thin Air," *Marine Corps Gazette* 104, no. 3 (March 2020): 21.
[5] Art Corbett, *Expeditionary Advanced Base Operations (EABO) Handbook: Considerations for Force Development and Employment* (Quantico, VA: Marine Corps Warfighting Lab, 2018); and *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2020).

led to a vigorous scholarly debate about the current force posture, capabilities, and readiness to fight peer or near-peer adversaries.

The authors of the handbooks addressing DMO, LOCE, and EABO, and the CPG focused on building a naval force that could operate within a peer or near-peer adversary's WEZ and deny them pockets of sea and air space. The purpose was to enable the United States to exploit these gaps for military advantage using the conventional fleet.[6] Essentially, the inside force denies battlespace to enemy ships and sensors, enabling the maneuverability and force protection of the large naval ships in the outside force.[7] Unfortunately, most of the research surrounding these concepts is theoretical and relatively nascent. Despite their novelty, these concepts consistently stress the importance of mobility, survivability, persistence, and the development of innovative technologies.[8] These qualities enable a distributed inside force to persist in a harsh environment and increase maneuver space for the outside force. Most researchers focus on the technology required to sense and strike targets in those locations. They short shrift the logistics innovations required to make concepts such as EABO successful. Although they agree that the U.S. Navy must decrease the inside forces' reliance on long logistics chains for sustainment during EABOs, those few specialists who propose innovations in logistics disagree on how to accomplish it.[9]

To address the problem at hand, this chapter only addresses expeditionary advanced bases (EAB) within the climate type unique to much of the South and East China Seas. The experts who developed DMO, LOCE, and EABO agreed that the current posture of the United States in the Pacific theater is vulnerable to A2/AD.[10] American adversaries accurately analyzed the Department of Defense's capabilities to project power abroad, developing a defense in depth of integrated weapons and sensors to counter the critical capability of the United States at forward bases and stations.[11] As a result of the A2/AD threat, many experts believe that America's large overseas bases and stations are no longer a source of power but instead represent vulnerabilities to the joint force.[12]

According to a map taken from the 25 January 2018 edition of *The Economist*, U.S. forces in Japan, South Korea, Okinawa, the Philippines, and Guam already reside within the Chinese WEZ (figure 1). If the United States and China went to war, the

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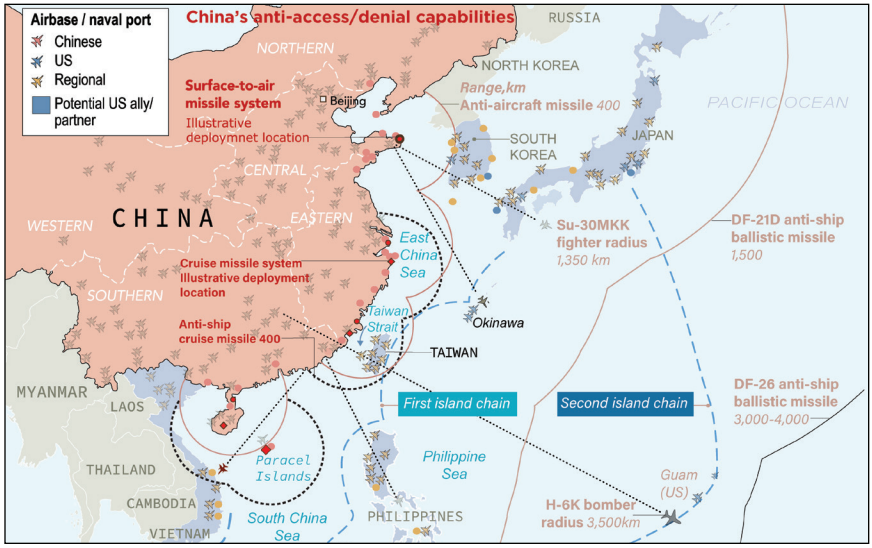
[6] Corbett, *Expeditionary Advanced Base Operations Handbook*, 25–26.
[7] Corbett, *Expeditionary Advanced Base Operations Handbook*, 21–22.
[8] Corbett, *Expeditionary Advanced Base Operations Handbook*; *Littoral Operations in a Contested Environment* (Washington, DC: Department of the Navy, 2017); Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019); and Michael E. Hutchens et al., "Joint Concept for Access and Maneuver in the Global Commons: A New Joint Operational Concept," *Joint Force Quarterly* 84 (1st Quarter 2017): 139.
[9] *Force Design 2030*, 5–6; and Corbett, *Expeditionary Advanced Base Operations Handbook*, 28.
[10] Benjamin Jensen, "Distributed Maritime Operations: Back to the Future?," *War on the Rocks*, 9 April 2015; and *Littoral Operations in a Contested Environment*, 5.
[11] Corbett, *Expeditionary Advanced Base Operations Handbook*, 9.
[12] Corbett, *Expeditionary Advanced Base Operations Handbook*, 15.

Figure 1. China's A2/AD capability in the South and East China Seas



Source: "The Odds on a Conflict between the Great Powers," *Economist*, 25 January 2018, adapted by MCUP.

disparate Chinese weapons systems could target ships and stations already within range, immediately denying the U.S. military access to the South and East China Seas.[13] The much-vaunted U.S. Carrier Strike Group (CSG), amphibious ready groups (ARG), and Marine expeditionary units (MEU) could not conduct forcible entry operations (FEO) within the region's littorals without suffering catastrophic losses to personnel and ships.[14] Arthur Corbett, the author of the EABO handbook, advises that military leaders must prestage equipment and supplies and create "more persistently forward postured—but continuously mobile—forces task organized for EABO" to rectify this vulnerability before any crisis arises.[15]

Some specialists suggest that to reduce risks to U.S. forces, diplomats should work with allies and partners in the region to host more mobile forces, as well as to continuously rotate them, to fulfill U.S. security obligations.[16] Other researchers counter that vacating large, fixed bases in USINDOPACOM for a more dispersed and constantly mobile posture will increase the strain on the logistics required to sustain the troops.[17]

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[13] *Littoral Operations in a Contested Environment*, 5–6.
[14] For more on FEO, see *Joint Forcible Entry Operations*, Joint Publication 3-18 (Washington, DC: Joint Chiefs of Staff, 2021).
[15] *Littoral Operations in a Contested Environment*, 13.
[16] *Force Design 2030*, 12; Corbett, *Expeditionary Advanced Base Operations Handbook*, 7–9, 12, 13; and Berger, *Commandant's Planning Guidance*, 11.
[17] Elee Wakim, "Sealift Is America's Achilles Heel in the Age of Great Power Competition," *War on the Rocks*, 18 January 2019.

Another risk is that China may perceive this new stance as escalatory. One option to mitigate the logistical strain is to increase contracted support in host countries, but relying on these types of partners could create hazards, such as increasing the likelihood of collateral damage and civilian deaths during an enemy attack. Overdependence on contracted assistance could also cause strained diplomatic relations if host nations' support for U.S. troops becomes unreliable. Another possibility that also avoids the perception of escalating tensions would be for the U.S. Department of State to negotiate the stockpiling of dual-purpose supplies in forward locations. Items such as tents, food, vehicles, heavy construction equipment, water purification capabilities, and other supplies used for humanitarian missions in the region are nonthreatening but can have a military value during any conflict. The underlying problem is that the naval force must choose between the logistic efficiencies that easily targetable fixed infrastructure provides and the increased logistical requirements of more survivable mobile forces.

According to the EABO and LOCE concepts, persistence requires the forces' survivability, which hinges on winning the "hider/finder" competition.[18] The creators also call for the United States to distribute its forces more broadly throughout the theater and reduce reliance on easily targetable infrastructure and sustainment platforms. If the United States restructures even a portion of its forces stationed abroad, provide them with new capabilities, and employ a more dispersed posture, the United States could get ahead of the A2/AD threat and mitigate an adversary's precrisis advantage.[19] Additionally, most experts agree that physical camouflage is no longer an adequate form of concealment on its own.[20] Foreign militaries now have access to sensors that can geolocate military forces based on their electromagnetic (EM) footprint, an ability that translates to targeting data for kinetic strikes, jamming, and cyber operations.[21]

To address this new issue, rather than employing traditional camouflage, a unit must manage its EM footprint or saturating the environment with EM decoys, perhaps the two most effective ways to hide on today's battlefield.[22] Future Marine Corps units conducting EABO missions within an enemy's WEZ will need to disguise their locations from enemy sensors using one of these two techniques. Currently, the U.S.

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[18] Corbett, *Expeditionary Advanced Base Operations Handbook*, 52.
[19] Corbett, *Expeditionary Advanced Base Operations Handbook*, 13.
[20] Bryan Clark, Whitney M. McNamara, and Timothy A. Walton, *Winning the Invisible War: Gaining an Enduring Advantage in the EMS* (Washington, DC: Center for Strategic and Budgetary Assessments, 2019); Brian Kerg, "Winning the Spectrum: Securing Command and Control for Marine Stand-In Forces," Center for International Maritime Security, 7 August 2020; Walker Mills, "A Tool for Deception: The Urgent Need for EM Decoys," U.S. Army War College War Room, 27 February 2020; and Joseph Trevithick, "This Is What Ground Forces Look Like to Electronic Warfare Systems and Why It's a Big Deal," Drive, 11 May 2020.
[21] Trevithick, "This Is What Ground Forces Look Like to Electronic Warfare Systems and Why It's a Big Deal."
[22] Mills, "A Tool for Deception."

military at large does not efficiently use either one.[23] Based on the vast expanses of open water in the Pacific Ocean, saturating the EM spectrum would prove difficult. The EABO mission requires small, lightly equipped, and highly mobile units. Adding EM decoys to their equipment list would increase their load. EABO units would also find it challenging to deploy EM decoys far from their mobile land bases. If commanders use air assets to situate the EM decoys for EABO units, the decoys would most likely need to be disposable because of the highly mobile nature of EABOs. The extensive distances between islands and landmasses in the Pacific are so great that EM decoys placed in the ocean might not enable a unit on a small landmass or island to hide its signature among the noise, potentially making it easy for enemies to guess the land-based unit is on the island. In the end, EM saturation might prove too challenging to accomplish and even counterproductive in the Pacific when conducting EABO. For these reasons, EM dispersion may not be as effective as signature management.

Dealing with EM radiation will require research, funding, and commitment from the Department of Defense (DOD) because manufacturers of the current capabilities and equipment did not always consider EM emissions when designing them.[24] The DOD should provide units conducting EABO with new resources that maximize utility and produce extremely low to zero EM signatures.[25] Large ships and permanent infrastructure are easy targets because they produce large, static, or slow-moving EM signatures. For this reason, Corbett recommends a more distributed posture. The United States has a stellar Navy, but its limited number of ships and each ship's importance to the overall mission makes it a brittle force.[26] Experts agree that this combination of excellence and fragility means the Navy will not be combat-effective on tomorrow's battlefield.[27] For this reason, the authors of DMO, LOCE, and EABO recommend an inside force to protect and facilitate the maneuver of an outside force.

Current Utilities Capabilities

The originators of DMO, LOCE, and EABO suggest that a capable inside force equipped with proper gear that generates low or zero EM emissions has a better chance of staying hidden within an enemy WEZ and facilitating the maneuver of the conventional naval forces.[28] The current electricity production and distribution equipment of the Marine Corps does not meet this low or zero EM discharge requirement. The majority of this electricity production capability relies on diesel-powered

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[23] Kerg, "Winning the Spectrum."
[24] Kerg, "Winning the Spectrum"; Trevithick, "This Is What Ground Forces Look Like to Electronic Warfare Systems and Why It's a Big Deal."
[25] Berger, *Commandant's Planning Guidance*, 11.
[26] Corbett, *Expeditionary Advanced Base Operations Handbook*, 17.
[27] Corbett, *Expeditionary Advanced Base Operations Handbook*, 17; *Littoral Operations in a Contested Environment*; and Jensen, "Distributed Maritime Operations."
[28] Corbett, *Expeditionary Advanced Base Operations Handbook*, 52; and *Littoral Operations in a Contested Environment*, 17.

generators and those that are not do not produce enough energy to meet the demands of a remote command post as currently designed.[29]

The U.S. military is the best-equipped one in the world. One could argue that it can overcome the A2/AD dilemma with its current weapons, doctrine, and logistics capabilities. This stance, however, appears optimistic given the emerging capabilities that peer and near-peer adversaries now wield. The authors of DMO, LOCE, and EABO guidelines rightly conclude that the current doctrine and capabilities of the Marine Corps may be inadequate in any future fight in the Pacific.[30] Although recommended changes remain outside of this chapter's scope, it is certain that the Corps's reliance on fossil fuels is a vulnerability that could be exploited in any future fight. The U.S. military's reliance on diesel powered generators dates back to their use for antiaircraft searchlights during World War I.[31] Even though the current inventory of these generators increased in reliability, output, and complexity, the power produced remains the same.[32] The Marine Corps has not conducted a significant overhaul of its generators, which were designed for warfare in Iraq and Afghanistan, in the last three decades.[33] The changing character of warfare will require this capability to adapt to the new threats. Before designing a new system, it is vital to take inventory of the requirements for such a system to work.

The Naval Surface Warfare Center (NSWC) and the Marine Corps Expeditionary Energy Office (E2O) conducted a study in October 2011 to profile the electrical energy usage of an average company-size combat operations center (COC) in Afghanistan.[34] Although the Afghanistan climate is different from that confronting an amphibious force in the South and East China seas, much of the study is relevant to the current topic. The NSWC and E2O study focused on an average patrol base supporting 45 Marines, in which the COC electrical energy demand per day averaged 30.24 kilowatt-hours.[35] This average represents the sum of all energy used when operating all lighting, a microwave, a coffee pot, and all computers and communications

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[29] *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*, Technical Manual (TM) 11300-15 (Washington, DC: Headquarters Marine Corps, 2020); Gerald Lance Volpp, telephone interview with the author, 8 January 2021, hereafter Volpp interview; and Eric B. Shields, *Current Power and Energy Requirements of Forward Deployed USMC Locations* (Carderock, MD: Naval Surface Warfare Center, 2012).

[30] *Littoral Operations in a Contested Environment*, 7–9; and Corbett, *Expeditionary Advanced Base Operations Handbook*, 9–10.

[31] "Military Mobile Electric Power," Olive-Drab, accessed 16 February 2021.

[32] "Military Mobile Electric Power."

[33] *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*; and Volpp interview.

[34] Maj B. H. Newell and Eric B. Shields, *USMC Expeditionary Energy Office Report on Expeditionary Energy Data Collection within Regional Command Southwest, Afghanistan* (Washington, DC: U.S. Marine Corps Expeditionary Energy Office, 2012).

[35] Shields, *Current Power and Energy Requirements of Forward Deployed USMC Locations*, 18.

equipment for more than 24 hours. The peak power requirement, which is the total of the load at any given moment, never surpassed 4.7 kilowatts.[36]

The study then added the energy requirements for ground-based operational surveillance systems (G-BOSS) and environmental control units (ECU)—air conditioners and heaters necessary for climate control for the computers. These essentials increased the power consumption to a total of 207 kilowatt-hours, peaking at 30.5 kilowatts. The ECUs were the most significant power consumers. According to the study, which identifies the ECUs by their Table of Authorized Material Control Numbers (TAMCN) of B0008 and the B0014, the B0008 produces 60,000 British thermal units (BTU) per hour and draws 11 kilowatts to generate heat and 8.5 kilowatts to deliver cold air. The B0014, a smaller variant, emits 36,000 BTU per hour and draws 9.6 kilowatts for heat and 4.5 kilowatts for cooling. Both models require a three-phase power source, which the diesel generators provide.[37] Another, more efficient option for an ECU does exist. An enhanced environmental control unit—TAMCN B0074-E2CU—is a single-phase variant that produces 9,000 BTU per hour and draws 1.635 kilowatts to cool at 95 degrees Fahrenheit and 2.023 kilowatts at 125 degrees Fahrenheit. In addition to running at lower energy levels, this unit could run using batteries and an inverter.[38]

The current family of diesel generators is perfectly suited for carrying the load described in the study. The generators that the Marine Corps currently employs range in capability, size, and load capacity (table 2). Yet, diesel generators carry a significant logistical burden and might not be the best option for a unit conducting EABO. Similarly problematic for EABO, most diesel generators emit a significant EM footprint. As one U.S. Army unit, the 11th Armored Cavalry Regiment, recently disclosed after a training exercise in early 2020, it is hard to hide on today's battlefield (figure 2). The unit's commander, Colonel Scott C. Woodward, posted this photograph, depicting the EM emissions of a battalion-size unit as seen from an EM sensor on a satellite, on social media along with comments about how camouflage netting is still valuable, but managing a unit's EM footprint is infinitely more critical on today's battlefield.[39] While the biggest EM emissions producers are communications equipment and radars when sending out burst transmissions, diesel generators and electrical grids also produce

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[36] The study employed two pieces of equipment, a Watts Up? 120VAC power data logger and Lascar Temperature Monitors, to gather the kilowatt readings. For more information, see Newell and Shields, *USMC Expeditionary Energy Office Report on Expeditionary Energy Data Collection within Regional Command Southwest, Afghanistan*, 2.

[37] Shields, *Current Power and Energy Requirements of Forward Deployed USMC Locations*, 16–18, 27.

[38] *Principal Technical Characteristics of U.S. Marine Corps Engineer Equipment*, TM 11275-15/3D (Washington, DC: Headquarters Marine Corps, 2009), 2-39.

[39] Trevithick, "This Is What Ground Forces Look Like to Electronic Warfare Systems and Why It's a Big Deal."

Table 2. Family of diesel generators currently in the Marine Corps inventory

Nomenclature	Kilowatt produced	Fuel capacity (in gallons)	Average fuel consumption (gallons per hour)	Wet weight in pounds (unit + petroleum, oil, and lubricants)
1 MPG	1	.66	.08	31
MEP-501A	2	1.6	.33	138
MEP-531A	2	1.6	.3	152
MEP-831A	3	4	.5	334
MEP-1030	5	3.8	.38 @ 75% load .43 @ 100% load	810
MEP-1040	10	6.3	.61 @ 75% load .75 @ 100% load	1,060
MEP-813A Tactical Quiet Generator (TQG)	10	9	1.07	1,272
MEP-1050	15	8.61	.9 @ 75% load 1.06 @ 100% load	1,610
MEP-1060	30	16.7	1.8 @ 75% load 2.46 @ 100% load	2,330
MEP-1070	60	34.7	3.51 @ 75% load 4.47 @ 100% load	3,205

Source: *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*, Technical Manual 11300-15 (Washington, DC: Headquarters Marine Corps, 2020).

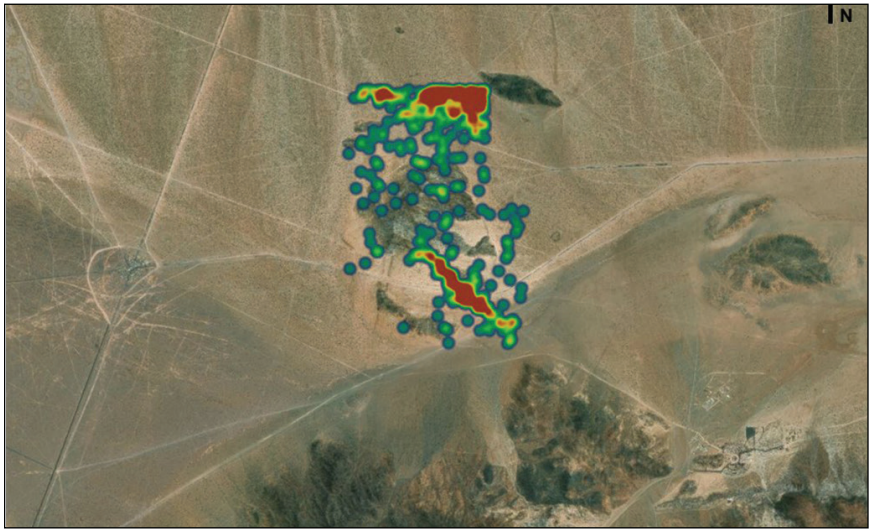
significant EM discharges.[40] Fortunately, the Marine Corps utilities community can find ways to replace the unit's reliance on diesel generators to assist units in reducing their EM signatures.

Besides contributing to the unit's EM footprint, diesel generators consume enormous amounts of fuel and are extremely heavy. The generator that powered the COC—as well as other sites, such as an aid station tent—in the NSWC and E2O study was a MEP-806 60 kilowatt, which is now retired from service.[41] If the COC

[40] Trevithick, "This Is What Ground Forces Look Like to Electronic Warfare Systems and Why It's a Big Deal"; and Phillip Knipe and Philip Jennings, "Electromagnetic Radiation Emissions from RAPS Equipment" (presentation, 42d Annual Conference of the Australian and New Zealand Solar Energy Society, Perth, Australia, 30 November–3 December 2004).

[41] Newell, *USMC Expeditionary Energy Office Report on Expeditionary Energy Data Collection within Regional Command Southwest, Afghanistan*.

Figure 2. Electronic emission signature of a battalion-size element



Source: Joseph Trevithick, "This Is What Ground Forces Look Like to Electronic Warfare Systems and Why It's a Big Deal," Drive, 11 May 2020.

used a 30 kilowatt generator instead of a 60 kilowatt one, energy consumption would limit its productivity, but it would save fuel by requiring less diesel. This pairing of the right capability with the requirement is part of a Marine Corps electrician's job.

During the planning phase of any mission, Marine Corps electricians calculate the supported unit's power requirements. They use this as a baseline for pairing it to the most efficient power production and distribution equipment. Doctrinally, generators should run at 80 percent capacity to maximize fuel efficiency, avoid unnecessary wear and tear on underutilized equipment, and accommodate unexpected surge requirements.[42] The average 30 kilowatt generator, MEP-1060, has a fuel tank capacity of 16.7 gallons.[43] Under laboratory conditions, running under an 80 percent load, and consuming 2 gallons per hour or 48 gallons total during 24 hours, the generator would need a refill after 8.35 hours.[44] The average 60 kilowatt generator, the MEP-1070, which replaced the MEP-806, has a fuel tank capacity of 34.7 gallons. While running under the same load and consuming a little more than 3.5 gallons per hour or 84 gallons total during 24 hours, would need a refill after about 9.9 hours.[45] Additionally, the generators

[42] Volpp interview.
[43] *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*, 6-9.
[44] *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*, 6-9.
[45] *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*, 6-11.

operate in pairs—sometimes more depending on power requirements—to balance loads and provide uninterrupted electricity in case one fails or there is a sudden surge. Taking all of this into account, a company COC would require two generators each weighing more than 2,000 pounds and requiring at least 48–84 gallons of diesel fuel per day. Utilities planners must trailer-mount generators in case the deploying unit has no access to a forklift. This assessment does not account for the lengthy setup time required to establish a power grid using the distribution panels and cables or the time it takes to displace such a grid. Generators are efficient and capable resources, but they have significant drawbacks.

The Marine Corps recognized the need for alternative energy sources and experimented with solar energy and battery storage in the past. The Ground Renewable Expeditionary Energy Network System (GREENS) and the Solar Portable Alternative Communication Energy System (SPACES) are two Marine Corps programs of record items (figures 3 and 4). Both saw service in Afghanistan during Operation Enduring Freedom (2001–14). Although capable systems, neither could power an entire COC like the one used in the NSWC and E2O study. SPACES's purpose is to deliver portable power to recharge the batteries of human-packable radios, specifically BB2590/U rechargeable batteries, and operate smaller communications equipment.[46] SPACES receives power from flexible or rigid solar panels, batteries, or NATO vehicles. GREENS, on the other hand, is slightly more capable. It consists of "man transportable components that, when assembled into a system, accepts energy from many different sources, distributes the energy using an intelligent management system, and stores excess energy to provide an average continuous output of 300 Watts (nominal) or 1,000 Watts (peak)."[47] It is meant to support a platoon-size unit operating far from the main supply routes. Compared to a diesel generator and in terms of the power requirements of an average company-size COC, GREENS is insufficient. Besides its lack of kilowatt production, it also does not follow a three-phase output, making the recommendation to use multiple GREENS packages unviable. A single GREENS could not provide enough power to use the smallest single-phase E2CU.

Another issue with the GREENS is its size as its components weigh more than 960 pounds. Considering that it fills an entire 1,800-pound quadruple container, getting it to the battlefield requires a vehicle and heavy equipment for offloading.[48] The current solar energy collection and storage technology in the Marine Corps inventory is insufficient to power an average company's COC. The Marine Corps needs to either develop new energy-producing capabilities, scale down its power requirements, or possibly both. Relying on fossil fuels and the current solar capabilities in a

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[46] "Man Portable Power System," Iris Technology, accessed 16 January 2021.
[47] *Principal Technical Characteristics of Marine Corps Family of Power Systems and Environmental Control Equipment*, 2-7.
[48] "Ground Renewable Expeditionary Energy Network System (GREENS) USON," Marine Corps Systems Command, accessed 17 February 2022.

Figure 3. Ground renewable expeditionary energy network system (GREENS)

Source: Official U.S. Marine Corps photo by Cpl Levi Schultz.

Figure 4. Solar portable alternative communication energy system (SPACES)

Source: Official U.S. Marine Corps photo by Sgt Chris Stone.

Table 3. Water requirements for tropical zones

Company	Daily gallons per person requirements	
Function	Sustaining	Minimum
Drinking	3.0	3.0
Field hygiene	1.7	0.3
Field feeding	1.3	0.8
Heat casulty treatment	0.2	0.2
Subtotal	6.2	4.3
+10% waste	0.6	0.4
Total	6.8	4.7

Source: *Petroleum and Water Logistics Operations*, Marine Corps Warfighting Publication 4-11.6 (Washington, DC: Headquarters Marine Corps, 2016), 10-3, adapted by MCUP.

future peer or near-peer conflict will prove extremely hazardous. The Marine Corps must explore other options.

Water is essential for life, and supplying individual Marines in a tropical distributed battlespace with 4.7–6.8 gallons per day is a daunting task.[49] Although this planning factor, at first glance, appears overly ambitious, Marines consume water for a variety of reasons during a military operation (table 3). In addition to drinking it, Marines use water for cooking, laundering, hygiene, medical treatment, decontamination efforts, engineer construction, and vehicle and aircraft maintenance.[50] The initial suggested requirement for water distribution to individual Marines of 4.7–6.8 gallons per day may be underestimating the requirement depending on the mission type or length of the mission, which is why the Marine Corps maintains a robust water purification capability.

Current water purification equipment in the Marine Corps is exceptionally designed to provide large quantities of potable drinking water. This cumbersome gear, however, was not designed to support a small, highly mobile force. Marine Corps water purification equipment uses the same reverse-osmosis technology—reverse osmosis water purification unit—that Marines did in 1979. This technology is still valuable for water purification, but recent advances in commercial technology do provide alternatives for EABO, especially due to their lower EM emissions than the current systems that rely on diesel generators.

The largest reverse osmosis unit in the Marine Corps inventory is the tactical water purification system (TWPS). It is a 13,000-pound component that can gener-

[49] *Petroleum and Water Logistics Operations*, Marine Corps Warfighting Publication 4-11.6 (Washington, DC: Headquarters Marine Corps, 2016), 10-13.
[50] *Petroleum and Water Logistics Operations*, 10-12.

ate 1,500 gallons of potable water per hour and requires a 60-kilowatt generator to power it (figure 5).[51] The Marine Corps began phasing this system out in 2019.[52] The next smaller size is the lightweight water purification system (LWPS), weighing about 1,251 pounds. Taking about 45 minutes to set up, the LWPS can produce around 75 gallons of potable water per hour from a saltwater source or 125 gallons of potable water per hour from a freshwater supply (figure 6).[53] The system can purify water in a chemical, biological, radiological, and nuclear (CBRN) contaminated environment, though the filters required to do so are costly—approximately $2,000 each—and have a shelf life of about two years.[54]

The LWPS is a self-contained unit that only requires an outside power source—a 3-kilowatt, 110-volt single-phase power source—in cold weather. Under typical circumstances, three organic diesel-powered pumps, each with a three-gallon internal tank that consumes half-a-gallon per hour per pump, runs the unit.[55] Therefore, an hour of operation requires 1.5 gallons of diesel to produce up to 125 gallons of potable water. A Marine unit of 45, like the one in the NSWC and E2O study, doctrinally would require at least 211.5 gallons of potable water per day. Assuming that the unit must pull from saltwater, this would require 2.82 hours of operation daily to keep up with the detachment's minimum demand, consuming 4.23 gallons of diesel. This consumption rate is reasonable for short-duration EABO missions, but at 1,251 pounds, the unit is not human portable. If mobility is vital to the success of an EABO, the LWPS would need to be trailer-mounted and require a vehicle to pull the trailer. Modifying it in such a way may make it a capable and successful solution to short-term missions, but it increases the capability's physical and EM signature. For more extended missions that also require mobility, the system's diesel fuel requirement and weight may limit its employment.

The smallest water purification technology for the Marine Corps is the individual water purification system (IWPS) block II (figure 7). The IWPS is small enough that individual Marines can carry it in their pack. Similar in shape and function to a straw, it can purify water from freshwater sources and a Marine can either drink directly through it or use it to filter water before filling canteens and Camelbacks.[56] Due to its limited filtration, the IWPS is not viable for a CBRN environment that requires extensive filtration, but it can block viruses, bacteria, and cysts, making it another option for personal water purification in certain circumstances.[57]

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[51] "Tactical Water Purification System," Marine Corps Systems Command, accessed 23 February 2022.
[52] MSgt Matthew Foust, telephone interview with the author, 8 January 2021, hereafter Foust interview.
[53] "Lightweight Water Purification System (LWPS)," Marine Corps Systems Command, accessed 23 February 2022.
[54] Foust interview.
[55] "Lightweight Water Purification System (LWPS)."
[56] Marine Corps Systems Command, "Tactical Tuesday: IWPS II," YouTube video, 23 January 2017, 0:52 min.
[57] Marine Corps Systems Command, "Tactical Tuesday: IWPS II."

Figure 5. Tactical water purification system (TWPS)

Source: Official U.S. Marine Corps photo by Cpl Jennessa Davey.

Figure 6. Lightweight water purification system (LWPS)

Source: Official U.S. Navy photo by PO2 George Bell.

Figure 7. Individual water purification system (IWPS) block II

Source: Official U.S. Marine Corps photo by Ashley Calingo, Marine Corps Systems Command, 23 January 2017.

The Fuel and Water Team at Marine Corps Systems Command (MCSC), which holds responsibility over all Marine Corps fuel and water systems, recently pursued several other smaller equipment called the platoon water purification system (PWPS), the small unit water purification system (SUWPS), and the squad water purification system (SWPS). Similar to the TWPS and LWPS, all three systems use reverse osmosis and all have the ability to filter freshwater. Only the PWPS and SUWPS can filter saltwater, and the SWPS can purify brackish water. Unlike the LWPS, none of them are able to purify water in a CBRN-contaminated environment.

The benefits of these experimental designs are their smaller size and their reliance on battery power. The manufacturer intended the PWPS to support a platoon-size unit. It comes in a 130-pound Pelican case and can generate 25 gallons per hour while running on batteries (figure 8).[58] The SUWPS is meant for a squad-size unit.[59] Contained in two Pelican cases and weighing 96 pounds, it runs on battery power and

[58] "Parker Hannifin's Platoon Water Purification System Awarded Contract with US Marine Corps," Parker Hannifin, 15 June 2020.
[59] Cpl Colby Wallace, "Small Unit Water Purification (SUWP)," Advanced Warfighting Experiment, video, accessed 17 January 2021, 2:54 min.

Figure 8. Platoon water purification system (PWPS)

Source: Official U.S. Marine Corps photo by LCpl Malik Lewis.

Figure 9. Small unit water purification system (SUWPS)

Source: Official U.S. Marine Corps photo by Sgt Paul Peterson.

can yield 15 gallons per hour (figure 9).[60] The third and smallest version, the SWPS, is housed in one small Pelican case the size of a backpack. It can purify five gallons per hour and can run using SPACES, GREENS, a BB2590/U rechargeable battery, vehicle power, or a generator (figure 10).[61] All three systems are relatively self-contained and none of them require expertise in water purification. At the time of this writing, the systems were still in the early prototype testing stages. While there are trade-offs

[60] "Aquifer 360 AFD Watermaker DC," Spectra Watermakers, 11 April 2017.
[61] Cpl Remington Hall, "With the Gear: Squad Water Purification System," YouTube video, 9 May 2016, 2:32 min.

Figure 10. Squad water purification system (SWPS)

Source: Official U.S. Marine Corps photo by Sgt Paul Peterson.

with all the currently available and prototype water purification systems, for a small and highly mobile force that requires a zero or low EM signature water purification capability, these smaller systems provide an exceptionally workable solution.

Emerging Concepts and Capabilities: Connectors

The U.S. Navy is capable of defeating any other nation's navy in the open ocean, which has pushed its adversaries to design their forces around contesting U.S. naval dominance in close and confined seas.[62] The development of A2/AD and long-range precision-guided munitions has made logistics operations incredibly hazardous within this contested zone. Several logisticians suggested that to support EABO, the U.S. Navy and Marine Corps should develop better ways of delivering supplies to those operating within an enemy WEZ.

In May 2019, Marine Corps logistics officer, Captain Dylan F. Metzler, made recommendations for a future logistics force. Metzler argued that a "future logistics system must be adaptive, anticipatory, responsive, redundant, simple, and cost-effective."[63] His recommendation aligns with the Navy's concept that those in the acquisition community must prioritize affordability during the entire process.[64] Metzler provided a coherent description of a system that included employing smaller, more affordable and

[62] Corbett, *Expeditionary Advanced Base Operations Handbook*, 19.
[63] Metzler, "Logistics in the Contact Layer," WE18.
[64] *A Cooperative Strategy for 21st Century Seapower* (Washington, DC: U.S. Navy, Marine Corps, and Coast Guard, 2015), 29.

agile surface connectors, logistics unmanned aerial vehicles (UAVs), disposable logistics gliders, and more economical vehicles that do not use as much fuel for resupplying units.[65] In another article, Captain Walker D. Mills, Navy lieutenant commander Dylan Phillips-Levine, and Navy lieutenant commander Collin Fox recommend that the Marine Corps should invest in unmanned logistics platforms. They promote employing low profile or semisubmersible vessels, like those used by drug smugglers, to deliver provisions to troops conducting EABO.[66]

The problem with what would be considered a better delivery vehicle is that it still has a logistics tether to a hub, leaving it vulnerable when en route to its destination. Just as the enemy poses a threat, curious boaters, rogue waves, and the ever-changing underwater topography can interrupt its movement as well. Even a bad storm can cause a delay in resupply or even total loss of the payload. The Ring of Fire, a path of active volcanoes and subduction zones, frequently causes tsunamis, earthquakes, volcanic eruptions, and typhoons in the Pacific Ocean, creating another potential danger for wrecking these vehicles. If a ship serving as a seabase for logistics resupply sinks for any reason, Marines are at risk of being stranded for extended periods. This possibility does not mean better connectors are a waste of tax dollars as they certainly could prove a valuable redundancy to supplement a more self-reliant force. In EABO, an abundance of capability and resiliency are critical to success.

Different Versus Better

Instead of searching solely for a better delivery system, the naval force must scale down the size of logistic assets and deliver power and water purification equipment closer to the point of use. Specifically, the Navy must reduce the need for delivery platforms for fuel and water capabilities. Self-sustainability is far superior to reliance on logistic resupply when conducting EABO. Frequent resupply missions put both the logistic and supported forces in danger. The logistic forces are vulnerable during transport and the supported forces can be detected during reception. As previously discussed, Lieutenant General Dana stated that "70 to 80 percent of all military logistics is the transportation of water and fuel."[67] This requirement is a heavy burden on the force. Leaders in the Marine Corps must urgently find ways to reduce the consumption of and the need to resupply these two commodities, which would significantly reduce the strain on the supply chain and enhance the warfighter's sustainability. The Marines must also continue to pursue technology that enables self-sufficiency in power and water. Rather than focusing on developing better connectors, the U.S. Navy should capitalize on emerging technologies developed during the last 10 years to make the units independent.

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[65] Metzler, "Logistics in the Contact Layer," WE18–WE24.
[66] Walker D. Mills, Dylan "Joose" Phillips-Levine, and Collin Fox, " 'Cocaine Logistics' for the Marine Corps," *War on the Rocks*, 22 July 2020.
[67] Metzler, "Logistics in the Contact Layer," WE22.

The Marines possess a historic example to illustrate the importance of self-sustaining units. Marine units that landed on Guadalcanal on 7 August 1942 understood the importance of clean water. Two days after the first landings, Japanese pressure on the fleet forced the U.S. Navy to leave the Marines stranded on the island with insufficient supplies.[68] Without fresh water from the ships, the 1st Marine Division treated water that they pulled from the Lunga River with chlorine to make it potable. The lack of proper drinking water led to numerous bouts of dysentery and gastroenteritis during the battle's early days.[69] Such a risk can cripple a fighting force's combat effectiveness. The experience of the 1st Marine Division illustrates the importance of self-sustainment in an EABO environment for modern Marine commanders. A future fight with a peer or near-peer competitor will come with the same risks related to provisions. Hazards related to resupply will force EABO Marine units to have to support themselves. A U.S. Navy ship will want to insert an inside force deep within the WEZ quickly, quietly, and without losing any ships in the process. The naval commander will also want to avoid conducting constant resupply missions that could place those inside forces or their ships at risk. The paradigm shift toward A2/AD in recent years means the Navy can no longer assume it will gain maritime and air supremacy against a peer or near-peer competitor in the early days of a conflict. It must change how it plans to sustain the warfighter inside the WEZ without endangering the Marines on the ground or giving away the troops' locations with regular resupply convoys. Units that can purify their drinking water on-site and produce their electricity without using diesel generators will increase its sustainability and reduce the risk to their mission.

Next Steps

Resiliency and persistence require redundancy in multiple capabilities. Reliance on one source of power or water creates another brittle force. A suite of instruments that Marines can pick and choose from based on the operating environment and their mission is paramount to mission success. Self-sufficiency in all things is unrealistic, but making smaller tactical units more independent in their power and water requirements unshackles them from a risky tether for more extended periods. Technology improves rapidly and there are many commercial off-the-shelf (COTS) tools already available, which could augment the Marine Corps' current power and water-making equipment inventories.

The new COTS technologies fit into several categories: power storage, power production from solar, wind, and hydroelectric sources, and water production. Although emerging technologies carry limitations and unknowns, scientists have made

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[68] Maj John L. Zimmerman, *The Guadalcanal Campaign* (Washington, DC: Historical Division, Headquarters Marine Corps, 1949), 49–50.
[69] Zimmerman, *The Guadalcanal Campaign*, 177.

significant progress in developing renewable energy sources, most notably in solar, wind, and hydroelectric power, during the last 50 years. The GREENS and SPACES take advantage of solar power to charge batteries and power small communications equipment, but also have downfalls for EABOs. GREENS is extremely heavy and requires a quadruple container for storage and a vehicle to transport.[70] Although SPACES is tremendously lightweight and can fit in a backpack, it provides little actual power, producing only 400 watts.[71] The Marine Corps Systems Command Power Team recently tested a device, the ultra-lightweight expeditionary power system (U-LEPS), to replace the GREENS. The U-LEPS is essentially a scalable and reconfigurable system composed of one or more 88 pound cases that each contain a high-density lithium-polymer battery core and a power input that can receive energy from NATO vehicles, solar panels, or shore power. Significantly for EABOs, it is 50 percent smaller than GREENS (figure 11).[72] A unit could deploy with one case or link multiple cases to provide additional power storage. It is a battery bank that provides up to 10 kilowatts of power and can accept scavenged energy from any source, even unreliable "dirty" sources.[73] The system does not come with any solar panels or power sources, but it does appear that it could provide the power storage adequate for supporting a 45 Marine unit. The unit would have to scale down its COC requirements, but this battery bank could power laptops, lights, radios, and an enhanced environmental control unit.

Scavenging power is an essential capability for a unit conducting EABO in countries with an underdeveloped power infrastructure. EABO missions will not always require the Marines to operate in seclusion. When in contact with an established power infrastructure, the U-LEPS's ability to scavenge from "dirty" sources will prove an asset for those units. The most preferable situation for these forces is having the ability to connect into a fully developed host nation's power grid that is interoperable with all U.S. equipment. Both the U.S. Department of State and U.S. Agency for International Development (USAID) could assist developing nations with this in mind. This interoperability would help Marines conducting EABO and serve U.S. forces responding to humanitarian crises.

Using solar energy to produce power for the U-LEPS is an option for units conducting EABO in harsh environments away from developed infrastructure, but the solar array needed to produce 10 kilowatts of electricity would be rather significant (figure 12). According to solar retailers, a house with a 10-kilowatt solar system installed would require 523.13 square feet of roof space to accommodate 27 solar panels.[74] Using this information as a basis, the portable solar arrays required would be problematic for transportation because the panels, depending on their thickness, would fill at least one quadruple container. Re-

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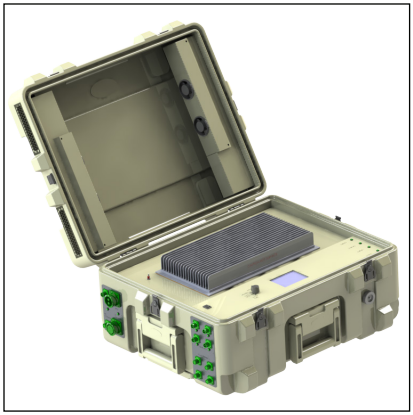
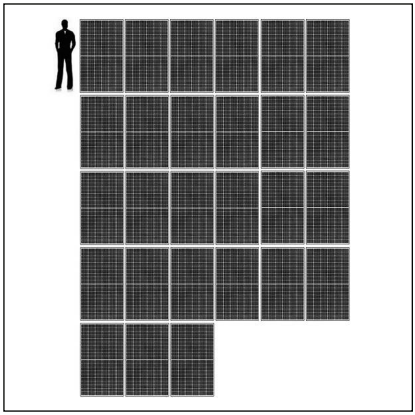
[70] "Ground Renewable Expeditionary Energy Network System (GREENS) USON."
[71] "Solar Portable Alternative Communication Energy System (SPACES)," Marine Corps Systems Command, accessed 23 February 2022.
[72] Volpp interview; and "Expeditionary Power," West Coast Solutions, accessed 18 January 2021.
[73] "Expeditionary Power."
[74] "10kW Solar System Prices and Information," SolarQuotes, accessed 18 January 2021.

Figure 11. Ultra-lightweight expeditionary power system (U-LEPS)



Source: "Expeditionary Power," West Coast Solutions, accessed 18 January 2021.

Figure 12. Required solar array to produce 10 kilowatts



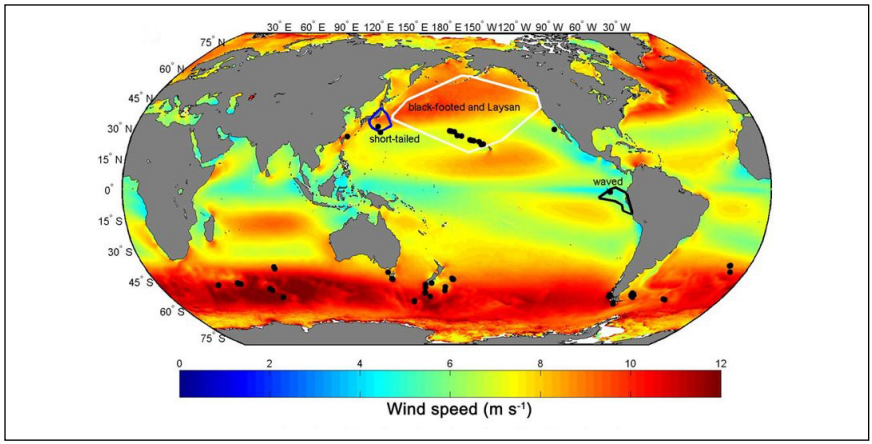
Source: "10kW Solar System Prices and Information," SolarQuotes, accessed 18 January 2021.

searchers in the special operations community recently experimented with PowerShade, a 22-foot by 40-foot fabric, pole-supported sunshade with photovoltaic cells woven into its fabric that produced 2 kilowatts.[75] It provided shade for operators and power for their equipment. Sunshades or camouflage netting help block the sun from the COC, allowing it to stay cooler and require less energy from an ECU during peak daylight hours. PowerShades could have a dual role for the COCs and billeting areas as it could produce power while reducing their energy consumption and their visible signature. Coupled with a few U-LEPs, solar energy could provide adequate power for a small COC in the right conditions.

Wind energy is another exploitable renewable power source. The Systems Command Power Team also looked into developing small wind turbines for forces operating far from main supply lines.[76] According to a recent study, the South and East China Seas have adequate wind averages to make this a viable option (figure 13).[77] Yet, capturing wind energy presents a key problem. This source is most effective when capturing air currents at 300-to-400 feet above the ground, where they are at their strongest.[78] Reaching those heights requires either building

[75] Robert Haddick, *Improving the Sustainment of SOF Distributed Operations in Access-Denied Environments*, Joint Special Operations University Report 16-2 (MacDill Air Force Base, FL: Joint Special Operations University Press, 2016), 39.
[76] Volpp interview.
[77] "Man Portable Wind Energy System," SBIR, accessed 27 July 2022; and Robert Suryan et al., "Wind, Waves, and Wing Loading: Morphological Specialization May Limit Range Expansion of Endangered Albatrosses," *PloS One* 3, no. 12 (December 2008): e4016, https:// doi.org/10.1371/journal.pone.0004016.
[78] Volpp interview.

Figure 13. Average wind conditions in the Indian and Pacific Oceans



Source: Robert Suryan et al., "Wind, Waves, and Wing Loading: Morphological Specialization May Limit Range Expansion of Endangered Albatrosses," *PloS One* 3, no. 12 (December 2008): e4016, https://doi.org/10.1371/journal.pone.0004016.

on a massive scale like commercial wind turbines or finding an alternative means to reach that height. The company Windlift is one of several manufacturers developing such capabilities. It is in the process of creating what they call airborne power generators (APG). Their APG design is a system composed of a ground-based, solid framed, tethered glider with propellers that capture passing wind currents and generate electricity from them—basically a kite that carries small wind turbines. Windlift designed this capability in several sizes, the smallest of which will weigh about 43 pounds and produce 700 watts to 1.5 kilowatts. The next largest APG will weigh about 113 pounds and generate up to 4.1 kilowatts.[79] Due to the flight altitude requirement, their signature is visible almost 2 kilometers away during daylight hours. These kites could help supplement solar power at night when the visual signature of the APG is not a concern and solar panels are no longer able to recharge batteries.

Although not as promising as solar and wind energy, hydroelectric energy is another route for a renewable energy source. Hydroelectric energy production relies on the same principles of fluid dynamics as wind turbines, using water rather than wind to capture the energy. The current products on the market are either too large or do not produce enough power to charge a battery bank like the U-LEPS. If Marines use an LWPS to produce water during EABO, however, it is conceivable that they could install a small hydroelectric turbine in the hose system before or after (possibly both)

[79] "Man Portable Wind Energy System"; and "Our Products," Windlift, accessed 27 July 2022.

the diesel pumps organic to the LWPS. This setup would produce power and potable water at the same time, making the most of the diesel fuel consumption.

As for water production, the current water purification options, including those already in the inventory of the Marine Corps, all rely on reverse osmosis. While the PWPS, SUWPS, and SWPS all seem promising, other available technologies can provide redundancy and resiliency to the capability and leaders in the Marine Corps must research alternate means of water production. In the tropical climate of the South and East China Seas, with regular and significant year-round rainfall, older technologies like rainwater diverters and collapsible cisterns may be an option for water collection away from water sources (figure 14).[80] Scientists recently experimented with interesting and promising new technologies, such as atmospheric water generators (AWG) and metal-organic framework (MOF) water harvesters.[81]

Both Metzler and Chief Warrant Officer 4 Sean C. Flores, a utilities officer with III Marine Expeditionary Force, recommend using AWGs to supply drinking water to forces conducting EABO.[82] An AWG is essentially a commercial version of a household dehumidifier. It requires electricity to draw the moisture out of the ambient air. AWGs typically work best in ambient air with temperatures above 45 degrees Fahrenheit and relative humidity of at least 30 percent.[83] According to the Asia-Pacific Data-Research Center, the average relative humidity is 65 percent for the year, reaching as high as 85 percent in the summer, in the South and East China Seas.[84] Average temperatures in the region are typical of tropical and subtropical climates, ranging from 68 to 87 degrees Fahrenheit.[85] AWGs, therefore, are ideally suited to the climate found in the Pacific region.

Metzler and Flores are correct that AWGs can provide alternative means of obtaining drinking water without depending on a static water source like the ocean, a stream, or a lake. The AWGs that are capable of providing enough water for a 45 Marine unit possess a significant trade-off as these use a significant amount of electricity. The GEN-350, an AWG produced by the company Watergen, weighs 1,720 pounds and can generate 238 gallons of clean water per day, but it draws about 5.6 kilowatts per hour and a maximum of 10 kilowatts at startup.[86] A diesel generator could quickly

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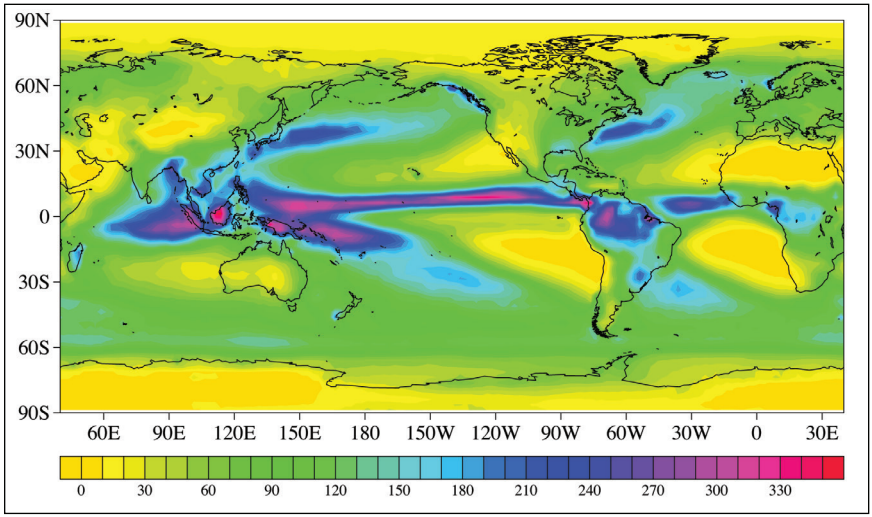
[80] "Legates Climatological Global Monthly Precipitation," Asia-Pacific Data-Research Center of the IPRC, accessed 17 March 2021.
[81] Metzler, "Logistics in the Contact Layer"; Flores, "Pulling Water Out of Thin Air"; Wentao Xu and Omar M. Yaghi, "Metal–Organic Frameworks for Water Harvesting from Air, Anywhere, Anytime," *ACS Central Science* 6, no. 8 (August 2020): 1348–54, https://doi.org/10.1021/acscentsci.0c00678.
[82] Metzler, "Logistics in the Contact Layer," WE22–WE24; and Flores, "Pulling Water Out of Thin Air," 22–23.
[83] Flores, "Pulling Water Out of Thin Air," 22.
[84] "APDRCLAS7—Asia—Relative Humidity," Asia-Pacific Data-Research Center of the IPRC, accessed 17 March 2021.
[85] "Center for Sustainability and the Global Environment," SAGE, University of Wisconsin-Madison, accessed 17 March 2021.
[86] Metzler, "Logistics in the Contact Layer"; Flores, "Pulling Water Out of Thin Air"; and "GEN-350 Product Sheet," WaterGen, May 2019.

Figure 14. Average monthly rainfall in the Pacific Ocean and China Seas



Source: Todd Mitchell, "Recent Climate Trends," University of Washington Research, accessed 15 July 2022.

meet this requirement, but it is unrealistic for a battery bank and renewable energy source to support its function. Additionally, the GEN-350's weight necessitates both its mounting on a trailer and a vehicle for mobility. Until companies develop more efficient, compact AWG units, they may not be compatible with most EABO missions when facing peer or near-peer adversaries. Despite these weaknesses for EABO in harsh environments, AWGs could still help U.S. operations. The United States could stage dual-purpose AWGs in present forward locations, tie them into existing power infrastructure, and maintain them for future use in either any humanitarian missions or to support troops conducting EABO in less severe locations (table 4).

A little further into the future, possibly within a decade, MOF water harvesters — a new technology based on capturing water from the air with through porous crystalline solids that does not currently exist as a commercial market product—may offer a viable option for EABO Marine units in the South and East China Seas. Researchers at the University of California, Berkeley, among a few other institutions, recently experimented with a MOF called Zr-MOF-808.[87] This particular MOF, one of about 20,000 known prototypes, can manufacture about 2.28 gallons of water per 2.205 pounds of MOF per day.[88] Researchers mainly tested this material in desert climates, but their findings point to greater efficiency in climates with increased relative

[87] Xu and Yaghi, "Metal–Organic Frameworks for Water Harvesting from Air, Anywhere, Anytime."
[88] Xu and Yaghi, "Metal–Organic Frameworks for Water Harvesting from Air, Anywhere, Anytime."

Table 4. Comparison of water systems for a 45 Marine Outpost

System	Weight (pounds)	Power source	Purification rate in gallons/ hour	Time to purify 211.5 gallons * in hours	Diesel fuel required in gallons	Vehicle and trailor required	1171 Marine required	Water source capabilites	CBRN filter
Lightweight Water Purification System (LWPS)	1,251	Three diesel pumps	75 from saltwater 125 from fresh-water	2.82 for saltwater 1.69 for freshwater	4.3	YES	YES	Salt, Brackish, and Fresh	YES
Platoon Water Purifi-cation System (PWPS)	130	Battery, or any 24 VDC or 120 VAC power source	25	8.5	NONE	NO	NO	Salt, Brackish, and Fresh	NO
Small Unit Water Purification System (SUPWPS)	96	Battery, or any 24 VDC or 120 VAC power source	15	14.1	NONE	NO	NO	Brackish, and Fresh	NO
Squad Water Purifi-cation System (SWPS)	18	Battery, or any 24 VDC or 120 VAC power source	5	42.3	NONE	NO	NO	Brackish, and Fresh	NO
Atmospheric Water Generator (AWG) WaterGens GEN–350	1,720	>10kW Gererator or shore power	9.9	21.3	~22.8**	YES	NO	Ambient Air	NO

* 45 Marines x 4.7 gallons per day per Marine = 211.5 gallons per day per Marine requirement.

** Gallons of diesel fuel required if using the MEP-813A Tactical Quiet Generator (TQG). This is a 10kW generator that consumes 1.07 gallons per hour of diesel fuel.

Sources: "Lightweight Water Purification System," Marine Corps Systems Command, accessed 23 February 2022; "Parker Hannifin's Platoon Water Purification System Awarded Contract with US Marine Corps," Parker Hannifin, 15 June 2020; Cpl Colby Wallace, "Small Unit Water Purification (SUWP)," Advanced Warfighting Experiment, video, accessed 17 January 2021, 2:54 min.; Cpl. Remington Hall, "With the Gear: Squad Water Purification System," YouTube video, 9 May 2016, 2:32 min.; and "GEN-350 Product Sheet," WaterGen, May 2019, adapted by MCUP.

humidity.[89] The MOF, currently only produced in powder form, requires a minimal electric charge to cause it to cycle from water capture to water release. Researchers at Berkeley formed Water Harvesting Incorporated in the summer of 2018 to commercialize the technology, both of which the Marine Corps should continue to monitor. One could only imagine a canteen cap adapter that incorporated MOF and a small battery to keep a Marine's canteen full at all times.

With technology continuing to mature during the next few decades, scalable, more capable equipment sets will prove necessary on future battlefields. One change that leaders can make immediately and that will dramatically affect EABO supportability is to enforce more discipline concerning energy and water conservation. During the wars in Iraq and Afghanistan, Marines took ready and abundant energy and water sources for granted. To do a better job of conserving water and power, units must leave coffee pots, microwaves, and other nonessential power requirements at home when tasked to conduct EABOs. While in the field, the forces will need to ration water and learn to recycle gray water when feasible. The idea to recycle gray water is nothing new. The 1st and 2d Marine Logistics Groups have already successfully experimented with the Greywater Reuse Filtration System, a prototype add-on filter to the LWPS.[90] The Marine Corps must continue to experiment and develop capabilities to reduce the stress on the military logistics chain and dependence on convoys to support sustainment in austere locations. They should focus on COTS technologies and promising emerging technologies, which go beyond the ones discussed here. Future researchers and military leaders must continue to push the conversation even further and develop capability sets and doctrine that enables a fully self-sustaining inside force. Self-reliance in all things may be a long way off, but creating technologies and doctrine that chip away at the forces' dependency on logistics hubs will benefit the Marines in any future fight.

Conclusion

Frequent logistic resupply missions put logistics forces in danger during transport and supported forces in danger of detection during reception, which requires the U.S. military to pursue technology that enables self-sufficiency. Technology that emerged during the last five years has made unit self-reliance a better option than experimenting with different connectors. To further decrease long logistical chains, the DOD must coordinate with the Department of State to negotiate with countries in USINDOPACOM to prestage dual-purpose capabilities and supplies. The Department of State and the USAID should also seek to develop power infrastructures around the world that are compatible with U.S. equipment. These efforts, benign in nature, will avoid

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[89] Xu and Yaghi, "Metal–Organic Frameworks for Water Harvesting from Air, Anywhere, Anytime."
[90] Kaitlin Kelly, "Marine Corps Explores Graywater Capability to Reduce Logistical Footprint," Office of Public Affairs and Communication, Marine Corps Systems Command, 19 July 2018.

escalating tensions with competitors in the region and further shrink dependence on long logistics convoys during a conflict.

Suppose a future Marine unit tasked with an EABO mission deploys to an ascetic location with PowerShades, SPACES, and APGs for power production, U-LEPS for energy storage, and PWPS or SUWPS for water purification. If that unit practices disciplined water and power conservation, then it would significantly reduce the requirement for logistics convoys of subsurface or low-profile unmanned connectors. These connectors would only provide sporadic, rare resupply of commodities that the unit cannot produce on-site. These steps would both make inside forces harder for the enemy to locate and increase their persistence, sustainment, and flexibility. By doing so, a unit conducting EABO would ensure that it was an asset rather than a burden to a Joint force maritime component commander.

Fortunately, EABO, LOCE, and DMO recently gained much traction. The *Commandant's Planning Guidance* and the ongoing force design efforts in the Marine Corps highlights that leaders at all levels are receptive to new ideas. The DOD must continue to fund research that enables military forces to survive and thrive in austere environments. Relying on long logistics chains for necessities like fuel and water will only endanger Marines operating within an enemy's WEZ. More specifically, the DOD should prioritize the development and employment of renewable energy, especially because the money and the commitment are there. Researchers also ought to continue to develop technologies and military professionals should further experiment with doctrine to lighten the logistician's burden and ensure the survivability of forward-deployed forces.

Chapter 2

Logistics Command and Control in Expeditionary Advanced Base Operations

The Need for Persistent Satellite Internet

Major Gloria C. Luedtke, USMC

Even the most prepared and self-sustaining hikers will run into unplanned logistics requirements when they go camping in austere locations. For example, if the hikers suddenly find their tents damaged in a fire, they may need to order tent-repair supplies from an online retail platform. Similarly, if they suddenly need to move their campsite, they could order transportation through a ride-hailing application on their smartphones. Yet, as anyone who camps knows, there is little to no internet connectivity in isolated areas, making even the most easy-to-use smartphone applications useless. These programs are analogous to command-and-control platforms that Marines use to manage and coordinate logistics support to operating forces.

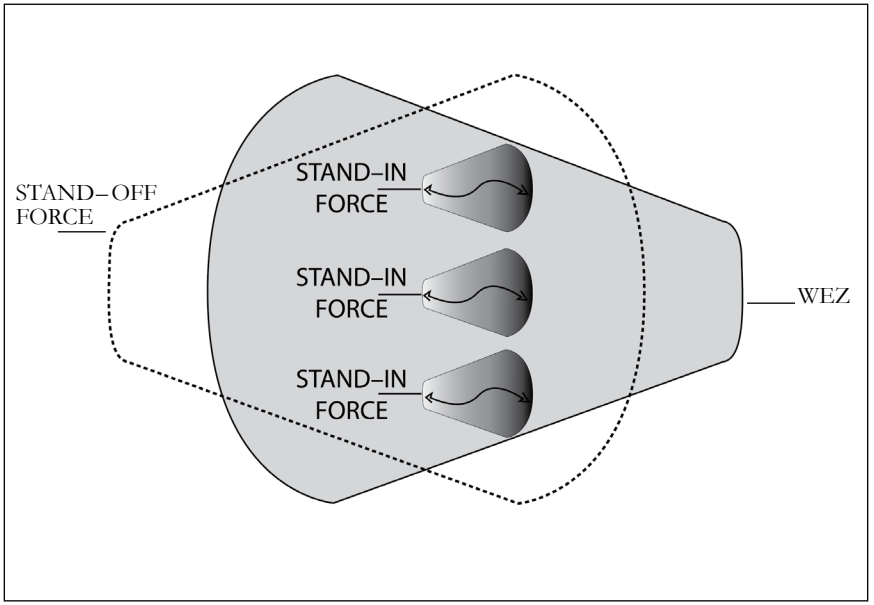
In expeditionary advanced base operations (EABO) scenarios, Marines establish temporary campsites with missiles in remote places, such as uninhabited islands. During EABO, Marines face the same logistics predicament as hikers sans internet: no communications connectivity. The problem is that Marines in these positions cannot effectively use Marine Corps logistics command-and-control (C2) platforms to coordinate support to and from expeditionary advanced bases (EABs). EABO units require high-bandwidth, low-latency, low earth orbit (LEO) constellation satellite internet to immediately request and transact logistics support using the command-and-control platforms.

Marine Corps Force Design Context

The Marine Corps is currently modernizing its logistical systems to support the recommendations laid out in *Force Design 2030*. Secretary of the Navy Kenneth J. Braithwaite and the Service chiefs of the Navy, Marine Corps, and Coast Guard unveiled a tri-Service strategy in December 2020 that explains America's strategy for naval warfare in modern great power competition against China and Russia.[1] Instead of following concepts related to conventional naval warfare from before World War II centered on ship-to-ship battles and beach landings for ground forces, the modern strategy combines new concepts requiring innovative technology and tactics. Naval forces now fight in distributed maritime operations (DMO) by way of the related

[1] *Advantage at Sea: Prevailing with Integrated All-Domain Naval Power* (Washington, DC: U.S. Navy, U.S. Marine Corps, and U.S. Coast Guard, 2020).

Figure 15. Idealized conceptual depiction of stand-off and stand-in engagement



Source: *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: Headquarters Marine Corps, 2021), 1-4, adapted by MCUP.

EABO and littoral operations in a contested environment (LOCE). DMO, LOCE, and EABO together "combine the effects of sea-based and land-based fires, enabling our forces to mass combat power at times and places of our choosing."[2] The goal of this strategy is to make America's military forces a credible deterrence against peer competitors that preserves its advantage at sea.[3]

The Marine Corps' contribution to the tri-Service strategy is primarily in EABO. Three months after releasing that strategic plan, the Marine Corps published the *Tentative Manual for Expeditionary Based Operations*. It defines EABO as operations in "austere, temporary locations ashore or inshore within a contested or potentially contested maritime area in order to conduct sea denial, support sea control, or enable fleet sustainment."[4] For this study and based on this definition, EABO is an arrangement where the *stand-in force* is located inside the weapons engagement zone (WEZ) (figure 15).

A WEZ is the bubble of space in which a weapons system can effectively hit a target. Inside the WEZ, an adversary could use multiple layers of forms of intelligence,

[2] *Advantage at Sea*, 7.
[3] *Advantage at Sea*, 2.
[4] *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: Headquarters Marine Corps, 2021), 1-4.

surveillance, and reconnaissance (ISR) and long-range missiles, expanding a WEZ. In the process, a WEZ potentially can encompass multiple nations; for instance, China could have a WEZ that includes Taiwan, Japan, and the Philippines at the same time. An EAB is a dispersed, hard-to-target forward base that has a low signature infrastructure inside an adversary's WEZ and usually stationed in an austere location like a sparsely inhabited island.[5] An unit operating *inside* and *outside* the WEZ is specific to defining the detachment's capability, not its physical position, according to the EABO concept. For instance, Marine Corps forces located in Japan, in the EABO context, is not close enough to China to project a sea denial effect inside the WEZ. Instead, small teams of Marines can deploy from Japan and land on remote dispersed islands well-inside China's weapons range to place them close enough to conduct temporary local sea denial in support of a naval campaign.

To fulfill these types of campaigns, the Marine Corps has focused on redesigning its force with the purpose of creating a unit that can operate within a peer competitor's WEZ. Known as the Marine Littoral Regiment (MLR), this detachment is meant to provide local sea denial and to be more lethal against a peer adversary while functioning in the WEZ.[6] The MLR is broken into multiple units with specific roles to contribute to EABO. Within the regiment, the Littoral Combat Team (LCT) sends small teams to EABs to conduct local sea denial while the Littoral Antiair Battalion (LAAB) is designed to perform local air control. The Littoral Logistics Battalion (LLB) acts as the MLR's organic logistics coordinator for the small teams positioned on remote dispersed islands.[7]

Similar to logistics units in previous conventional wars, the LLB strives to support combat forces inside an adversary's weapons reach. The Marine Corps notes that effective sustainment to EABO "extends operational reach" and enables persistence of "decentralized forces throughout the littorals."[8] The LLB's sustainment of the MLR's operations in an EAB comes with its own unique set of problems compared to conventional logistics. First, EABO logistics elements would need to support forces that constantly and unpredictably relocate from one maritime EAB to another. Second, this tactical provisioning would occur inside key maritime terrain primarily on austere islands with minimal local infrastructure. Third, the LLB will conduct their resupply operations with a new focus on survivability inside the adversary's WEZ. Traditional logistical systems are vulnerable due to their reliance on slow, predictable,

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[5] Arthur Corbett, *Expeditionary Advanced Base Operations (EABO) Handbook* (Quantico, VA: Marine Corps Warfighting Lab, 2018); and Arthur Corbett, "Restoring the Initiative: A Discussion on the Assumptions and Concepts Shaping the Next Paradigm of Naval Warfare" (presentation, Advance Naval Technology Exercise-Industry Day, Quantico, VA, 7 January 2020).

[6] Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019); and *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2020).

[7] Col Andrew R. Winthrop, USMC, "Force Design 101 and Logistics Implementation" (PowerPoint presentation, Washington, DC, 11 May 2020).

[8] *Tentative Manual for Expeditionary Advanced Base Operations*, 7-1.

and stationary elements, and require their own security forces, which would go against the mobility of EABO. Therefore, LLBs will likely turn to quicker, more flexible channels, such as air drops, submarines, unmanned delivery vessels, smaller-size naval vessels like light amphibious warships, and foraging local resources. To support these MLR-specific requirements, the LLB's command and control for its organic capabilities and other reinforcements needs to be faster than ever before.

The MLR's composition and mission require the LLB to adopt a form of command and control that is more responsive than conventional ones, where a support request must go through several layers of coordination before reaching the provider. To create more immediate responses, the LLB's command and control must be adaptable and flexible enough to allow subordinate units to operate independently of higher headquarters, but also secure and reliable enough for changes to the mission to be communicated quickly and effectively. It must also be resilient and sustainable inside an adversary's WEZ, across a variety of missions, and over the great distances in which the MLR will be operating. To fulfill these requirements, the Marine Corps suggests that both supported and supporting forces must be lighter.[9] These forces must pack only bare necessities and avoid prepositioning stockpiles, which inversely increases the requirement for resupply missions to sustain them for longer than a few days.

For immediate yet unpredictable resupply missions, the speed of support request transactions must be fast enough to enable on demand delivery. Customers using commercial on demand services, such as ride-hailing through Uber or grocery delivery through Amazon Now, can track their requests in real time when connected to 4G internet capabilities. In contrast, the current Marine Corps logistics services, such as Global Combat Support System-Marine Corps (GCSS-MC), are neither on demand nor are trackable in real-time through their C2 platforms due to a lack of constant internet connectivity. For instance, GCSS-MC loads slowly or not at all if the internet is high latency (slow) or intermittent (breaks in connectivity), but works well when connected to reliable internet. New satellite technology makes it possible for deployments to have constant high-bandwidth, low-latency internet in places with no infrastructure, like positions in the middle of the ocean.

In EABO, the LLB's command/support relationships require immediate connectivity between supported and supporting units. The LLB's C2 with supported units, down to the LCT small team level, must have the ability to communicate unpredictable sustainment or transportation requests from isolated positions to coordinate immediate movement control plans, resupply, and maintenance. Although the LLB is designed with enough capabilities and supplies to organically sustain the MLR in most operations, the rest of the Marine Corps provides additional support. Resembling Amazon's complex of warehouses and contracted companies that allow it to ensure

[9] *Tentative Manual for Expeditionary Advanced Base Operations*, 7-1.

ultrafast delivery, the logistical network for the Marine Corps consists of a web of mutually supporting units stationed at various points around the world.[10]

In practice, the LLB would need dependable communication with various supporting units. During an operation, the LLB must remain in contact with either a Marine Expeditionary Brigade (MEB) or a Marine Expeditionary Force (MEF) at the top levels. At the tactical level, LLB's require connections with logistics providers already at sea, such as Marine Expeditionary Units (MEU) and other Marine Air-Ground Task Forces (MAGTF). On an operational level, communication with Marine Corps Logistics Command (MARCORLOGCOM) offers the LLB logistical networks on a global scale. To illustrate one level of this communication, if an LLB requires a beach landing to resupply, the unit, which does not have an organic transportation structure to do so, would turn to a MEF unit. An LLB could coordinate with the nearest MEF Landing Support Battalion to perform the beach landings. In such circumstances, the LLB would need to establish and maintain stable C2 with the MEF to quickly synchronize beach landing support for unpredictable movements in the littorals.[11]

The LLB would also have to communicate with external sources of support, most of which operate outside of the adversary's WEZ. Similar to how Amazon can rely on contracted external sources to provide services when it does not have a certain item, the MLR's operations are in support of naval fleet campaigns, so they are inextricably linked to the fleets. The LLB will have to tap into the Navy's logistics enterprise more than it does now because of the MLR's operational relationship with the fleet, the highest echelon of which includes the element that supports all Joint forces, the Maritime Prepositioning Forces (MPF).[12] The MPF are forward deployed ships, referred to as a Maritime Preposition Ships Squadron (MPSRON), with all classes of supply coordinated by U.S. Transportation Command (USTRANSCOM) for any of the Department of Defense combatant commands. For an EABO, however, this logistics system is a long chain that can be problematic due to its lack of speed. If an MLR in Japan, for instance, requests support from an MPS squadron, it would

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[10] Alina Selyukh, "Optimized Prime: How AI And Anticipation Power Amazon's 1-Hour Deliveries," NPR, 21 November 2018. Amazon uses artificial intelligence to identify the nearest location of a purchased item to the buyer, move the item robotically in the warehouse to shipping, and coordinate contracted drivers to deliver the item in less than an hour.

[11] Gidget Fuentes, " 'Red Patch' Is Back as Reactivated Landing Support Battalions Rejoin Fleet Marine Forces," *USNI News*, 23 October 2020; and Winthrop, *Force Design 101*. The LLB is designed from the structure of a Combat Logistics Battalion (CLB), made up of companies of bulk fuel, engineering, food service, heavy equipment, maintenance, motor transport, and landing support. However, the Landing Support Battalions, reactivated in late 2020, absorbed landing support companies from CLBs. As a result, beach landing support resources are pooled and can, in general, support a greater variety of Marine Corps units, including the LLB.

[12] "Prepositioning (PM3)," U.S. Navy's Military Sealift Command, accessed 10 March 2021; and Brad Stone, *The Everything Store: Jeff Bezos and the Age of Amazon* (New York: Little, Brown, 2013), 82. Amazon's business model evolved where the company bought or contracted with outside companies, such as Toys-R-Us, Zappos, and Whole Foods among hundreds of others, so that the purchase is directly through Amazon but delivered by the contracted companies.

first submit a request for specialized medical supplies from III MEF in Japan, which then forwards it to the U.S. Pacific Fleet at Joint Base Pearl Harbor-Hickam, Hawaii. The Pacific Fleet then sends it to USINDOPACOM also in Hawaii, which coordinates with USTRANSCOM at Scott Air Force Base, Illinois. USTRANSCOM takes the final step to direct the MPS in the Pacific Ocean to deliver the supplies to the MLR. The length of this coordination chain makes it so that the MLR's request would need to be processed nearly immediately at every level for it to receive this external support.[13]

Marine Corps leadership argues that "the littoral force's concept of support should aim to flatten the logistic and sustainment networks as much as possible, with logistics assets at the operational level providing logistics directly to end users when feasible."[14] The tangible requirement to flatten this arrangement is the ability for the end user, the LLB, to communicate directly with operational-level providers at the combatant command level. Access to an unbroken line of communication, usually through a fast internet connection, and an automated supply sourcing system would enable immediate processing of logistics requests in the Marine Corps and the U.S. military, more generally.

Contracting with the civilian industrial base, partners and allies, host nation organizations, and local markets offers an external logistic option. Within the EABO concept, "a foraging skillset enabled by micropurchases" through operational contract support is a way for the lowest level of operators to sustain themselves.[15] To facilitate these relationships at the lowest unit level, the LLB would have to prescreen suppliers, arrange for legal methods of payment, and otherwise precoordinate all steps for micro-purchases on behalf of the detachments. Such local and non-DOD sources of support rely on mutually accessible platforms and networks for coordination. To do so, the Marine Corps must use unclassified information systems to coordinate with these external suppliers that do not have access to the Department of Defense information network. In conventional wars, the various logistics functions were heavily coordinated across unclassified networks, such as commercial air or sealifts and contracts in support of Joint force requirements. Ideally, in future wars, the stable internet source for transmitting logistics coordination in EABO can host both classified and unclassified communications so that both military and nonmilitary entities can feasibly connect while still complying with cybersecurity requirements.

The EABO Logistics Problem

Currently, Marine Corps logistics is coordinated on web-based platforms, but most EABO occur in areas with little to no internet connectivity. The primary Marine Corps

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[13] *Maritime Prepositioning Force Operations*, Marine Corps Warfighting Publication 3-32 (Washington, DC: Headquarters Marine Corps, 2011), 2-3.
[14] *Tentative Manual for Expeditionary Advanced Base Operations*, 7-7.
[15] *Tentative Manual for Expeditionary Advanced Base Operations*, 7-4.

logistics C2 platform—the communication medium and database shared between supported and supporting units—is the Global Combat Support System-Marine Corps, an Oracle web-based logistics platform used on unclassified networks.[16] The GCSS-MC resembles commercial websites and applications, such as eBay and Target, where civilians can go to perform transactions and track available stock in their stores. Similarly, Marine personnel employ the GCSS-MC to request, track, and return supplies. In addition to its similar roles as commercial platforms, GCSS-MC also acts as the repository of maintenance information and material readiness statistics for each unit.

The Marine Corps does have access to other logistics C2 platforms. Common Logistics Command and Control—a logistics support request tracker, the Transportation Capacity Planning Tool—a transportation management application, and good old-fashioned Microsoft Outlook email all allow for logistical managements, but are much smaller in scale than GCSS-MC.[17] Because these platforms have the same infrastructure requirements as GCSS-MC, their use faces the same issues and solutions. Therefore, the analysis here can apply to any of these logistics C2 platforms.

To run any of the command-and-control platforms, including GCSS-MC, Marine units would require laptops to host the platforms and high-bandwidth, low-latency internet connectivity to exchange information. The amount of bandwidth processed and traveling from one place to another limits internet usage. These platforms vary in bandwidth requirements, which affects their feasibility in austere environments where bandwidth is rationed and prioritized. GCSS-MC's bandwidth requirement is exceptionally large because the system hosts a significant amount of information while having security protocols that limit access to registered users.[18]

Typically, variances in the internet connectivity for Marines either in garrison, afloat, or in austere on-land locations constrains the use of logistics platforms like GCSS-MC. When in garrison, Marines use GCSS-MC over the Marine Corps Enterprise Network (MCEN), which is secure internet over fiberoptic cable.[19] Due to its limited bandwidth, Marines who regularly employ GCSS-MC must arrive before and stay after normal working hours to take advantage of available bandwidth.[20] When afloat, Marines tap into GCSS-MC using shipboard satellites. When ashore but not in garrison, such as during a field exercise, Marines use mobile satellite systems, such as

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[16] Bradley Wilson et al., *Naval Operational Supply System: Analysis of Alternatives* (Santa Monica, CA: Rand, 2018), https://doi.org/10.7249/RR2403.
[17] Capt Andrew Schaffer and Capt Nick Borns, "Logistics Command and Control: CLC2S in a Garrison Environment," *Marine Corps Gazette* 99, no. 10 (October 2015): DE4–DE6; and Joe Stevenson, "CTC's Transportation Capacity Planning Tool—a USMC 'Bridge Technology' Success!," Concurrent Technologies Corporation, 2010.
[18] Capt Brandan R. Schofield and Capt Brittany Snelgrove, USMC, "Blockchain Access Management with Global Combat Support System—Marine Corps" (master's thesis, Naval Post Graduate School, 2019).
[19] Steve Oakley, *Summary of Technical Support: 26th MEU GCSS-MC Network Traffic Analysis Report* (Camp Pendleton, CA: Marine Corps Tactical Systems Support, 2018).
[20] Author's personal experience as a logistics officer at Marine Corps Base Camp Pendleton, CA, and Marine Corps Base Camp Lejeune, NC, from 2010 to 2017.

very small aperture terminals and secure mobile antijam reliable tactical terminals.[21] In all cases, Marines have to adapt to limited internet bandwidth to access GCSS-MC.

When used as Oracle intended, GCSS-MC performs as a complete repository of information, which causes it to consume massive amounts of bandwidth. In an isolated or remote environment, such as an EAB, Marine units will not have access to the necessary internet connection for it to work properly as multiple after action reviews by Marine detachments have illustrated. Marines operating anywhere that was not connected to fiberoptic cable internet found that users can neither log into GCSS-MC nor can they conduct transactions and order mission essential repair parts.[22] In 2018 and 2019, Marine Corps Tactical Systems Support Activity (MCTSSA) conducted studies of the 15th MEU, 26th MEU, and the 1st Marine Logistics Group (MLG) to compare how Marines used GCSS-MC when deployed at sea with when they were in garrison. It found that while afloat, the MEUs lacked persistent internet connection, making GCSS-MC difficult to access. The summary reports that poor internet connectivity "doubles the interaction time with the system, greatly reducing the efficiency of the user experience."[23] Indeed, the 15th MEU experienced problems when afloat because of a "complex network infrastructure" that provides "insufficient data."[24] The 26th MEU had relative success with GCSS-MC only because the ship's communications officer "invested in grooming the network to provide an optimal environment for GCSS-MC traffic."[25] Yet, the 26th MEU still had login and latency problems with GCSS-MC despite the network grooming. The collective experience of the two MEUs illustrates that the GCSS-MC will not work in EABO for lack of reliable internet.

Although GCSS-MC usage suffered higher degradation with satellite internet on ships than with fiberoptic cable internet, the latter connection also saw slowdowns during high traffic hours, as the 1st MLG highlighted. The MCTSSA study concluded that to optimize the connection to GCSS-MC, the 1st MLG needed to either find ways to reduce bandwidth usage or to access the system during nonpeak hours.[26] As of this writing, only Oracle upgrading the platform to have an offline module can improve the user experience. This development would allow users to input data while disconnected from the internet,

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[21] Oakley, *Summary of Technical Support*.
[22] Schofield and Snelgrove, "Blockchain Access Management with Global Combat Support System," 8–9.
[23] *GCSS-MC Network Performance Summary of Findings* (Camp Pendleton, CA: Marine Corps Tactical Systems Support Activity, 2019).
[24] *Summary of Technical Support: 15th MEU and Camp Lejeune GCSS-MC Network Traffic Analysis Report* (Camp Pendleton CA: Marine Corps Tactical Systems Support Activity, 2018).
[25] Oakley, *Summary of Technical Support*. *Grooming the network* is an industry term for artificially increasing bandwidth by adding cables, partitioning frequency channels, or assigning usage time slots. Richard S. Barr and Raymond A. Patterson, "Grooming Telecommunications Networks," *Optical Networks Magazine*, May/June 2001, 20–23.
[26] *Summary of Technical Support: 1st Marine Logistics Group* (Camp Pendleton, CA: Marine Corps Tactical Systems Support Activity, 2018).

leaving the transactions in a queue for processing once GCSS-MC is reconnected.[27] This solution would not resolve the issue, however, because it simply concedes that there is no internet, making logistics coordination impossible when deployed at sea. If changing the logistics command and control platform does not settle the problem of the low internet bandwidth, then the answer must be to increase internet bandwidth and connectivity.

Solution

With the need for flexibility in EABO, most existent sources of internet connectivity would hinder the units due to their reliance on fiberoptic cables. For example, wireless 4G internet accessible by smartphones are radio waves transmitted from cellphone towers that are physically connected by fiberoptic cable to an internet hub in a building, which are attached to more internet hub buildings by more fiberoptic cables. Even internet hubs connecting transoceanic countries transmit information through fiberoptic cables under the ocean.[28] In EABO, Marines would not build the required infrastructure because it is meant to be temporary and austere. Without infrastructure for fiberoptic cables at an EAB, like on MEUs afloat, the only alternative for internet connectivity must be from satellites.

Low earth orbit (LEO) constellation satellites would provide EABO the most reliable connectivity. Currently fielded Mobile User Objective System (MUOS) satellite communication (SATCOM) is insufficient for GCSS-MC connectivity in EABO. The limited bandwidth of legacy SATCOM forces commanders to prioritize this scarce resource for fires and intelligence operations over other requirements like logistics and administration. The Marine Corps has been upgrading its legacy SATCOM with the latest technology, the MUOS, that has been tested for internet access in austere environments during Marine Corps field exercises.[29] MUOS, which is fielded by the Navy and used by the Marine Corps, is a satellite constellation of five satellites and is built to be compatible with legacy communication assets.[30] Although MUOS is operational, it is limited in bandwidth capacity and suffers from high latency when tested in field exercises, making it insufficient for GCSS-MC connectivity in EABO.[31]

As technology devalues with time and the advent of new devices, MUOS is now considered usable but slow, much like 3G cellular service. MUOS is a geostationary orbit

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[27] Mike Barerra, "New Mobile Solution for GCSS-MC Ensures Marine Corps Readiness," *Rite Solutions* (blog), 17 November 2020.
[28] Cleo Abram, "How Does the Internet Work?—Glad You Asked S1," YouTube video, 8 January 2020, 19:53 min.
[29] Matt Gonzales, "Corps' Satellite Communication System Exceeding Performance Expectations," Marines.mil, 3 June 2020.
[30] "MUOS SATCOM System Declared Ready for Full Operational Use," *Naval Technology*, 17 October 2019; and Chip Eschenfelder, "Mobile User Objective System MUOS," Lockheed Martin, 27 November 2020.
[31] Gidget Fuentes, "Marines Put Next-Generation MUOS SATCOM to the Test in Expansive Exercise," *USNI News*, 4 March 2020.

(GEO) satellite, positioned much farther from Earth compared to a LEO satellite. LEO satellites, being closer to Earth's surface, allows them to possess increased connectivity and more stability with ground-based receivers.

The proliferation of LEO satellites since 2019 has introduced credible capabilities of space-based broadband communications, although it is only available from LEO.[32] Compared to MUOS, LEO constellation satellite internet is faster and more stable 5G cellular service. Additionally, most current military satellite systems in GEO or further orbits are comprised of just a few satellites orbiting around Earth. MUOS, for example, is only five satellites.[33] LEO constellation satellites would consist of hundreds to tens of thousands of satellites, which would ensure constant worldwide, low-latency internet (figure 16).[34]

LEO constellation satellite internet is also higher redundancy, higher survivability, and is more readily available commercially than MUOS. These factors make LEO constellation satellite internet the best option for logistics C2 platforms in EABO. A LEO constellation of satellites, being comprised of so many satellites, could withstand losing a few before it loses capacity.[35] If China or Russia ever attacked a U.S. constellation that has tens of thousands of satellites with kinetic antisatellite weapons that are currently being developed, they would "require hundreds of costly weapons to destroy satellites that would be relatively inexpensive to replace."[36] LEO constellations have high survivability, a valuable trait in a contested EAB environment that, when combined with other factors, allows it to maintain the high-bandwidth, low-latency uninterrupted internet any EABO units require for logistics command and control platforms.

The DOD is already investing in LEO satellite constellations and the Marine Corps can quickly become a consumer. Among the several constellation companies competing for DOD contracts, SpaceX's Starlink is the primary awardee.[37] Starlink is a commercial space internet constellation intended to "provide internet all over the globe, particularly in remote or rural areas where connectivity is limited or completely unavailable."[38] As of this writing, about 800 Starlink satellites have been placed in orbit. The DOD's investment in LEO satellites is a healthy indication that Joint forces soon will have the ability to field even more LEO capabilities.[39] American competitors are also investing deeply in LEO constellation satellites. China, for example, is re-

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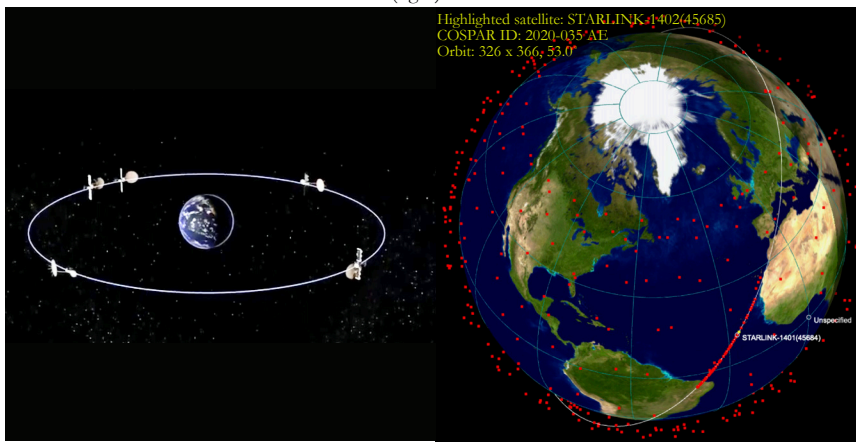
[32] Matthew A. Cottom and Travis S. Hallex, "Proliferated Commercial Satellite Constellations: Implications for National Security," *Joint Force Quarterly* 97 (2d Quarter 2020): 21.
[33] "MUOS SATCOM System Declared Ready for Full Operational Use."
[34] Nathan Strout, "Gotta Go Fast: How America's Space Development Agency Is Shaking Up Acquisitions," C4ISRNET, 9 November 2020.
[35] Cottom and Hallex, "Proliferated Commercial Satellite Constellations."
[36] Cottom and Hallex, "Proliferated Commercial Satellite Constellations."
[37] Strout, "Gotta Go Fast."
[38] SpaceX, "Starlink Mission," YouTube video, 24 November 2020, 31:38 min.
[39] Nathan Strout, "One Military Space Agency's Plan for 1,000 New Satellites by 2026," C4ISRNET, 21 January 2020.

Figure 16. Artists' renderings of the five MUOS satellites in geostationary orbit (left), compared to Starlink's thousands of satellites in low earth orbit (right)



Source: Justin Ray, "Preview: Atlas 5 Launching MUOS 5 for Mobile Forces Across All Branches of U.S. Military," SpaceFlightNow.com, 21 June 2016; and Steve Jurvetson, Los Altos, CA, adapted by MCUP.

portedly underway with launching 13,000 of their own satellites.[40] A single integrated LEO satellite-based SATCOM access system for all U.S. forces to use reliable internet would benefit even the most austere military operations.

Ideally, the DOD could potentially field LEO constellation satellites to the Joint Services from private companies, such as Starlink, as soon as their satellites are in orbit and functioning. The Navy and Marine Corps spent 15 years developing MUOS with Lockheed Martin until it reached fully operating capability. By now, this technology is stale compared to LEO constellation satellites.[41] The Air Force Space Command, the DOD's lead for procurement of commercial satellite communications, has been much faster experimenting with LEO constellations than the Navy was with MUOS. A little more than a year ago, the Air Force's Defense Experimentation Using Commercial Space Internet (DEUCSI) program awarded Starlink $28 million to connect military platforms, including aircraft and ground terminals, and awarded smaller contracts to Iridium, Telesat, and O3b to experiment with LEO broadband internet.[42] Since then, Starlink's LEO satellites have surpassed all of the program's expectations. It is so user friendly that an operator can "plug it in and plant where it is: that's how

[40] "China Pushes Ahead with Giant 13,000 Satellite LEO Constellation," Spacewatch Global, 4 October 2020.
[41] *Mobile User Objective System (MUOS) as of FY 2015 President's Budget*, Selected Acquisition Report (San Diego, CA: Program Executive Office, Space Systems, 2014), 8.
[42] Sandra Erwin, "Air Force Enthusiastic about Commercial LEO Broadband After Successful Tests," *SpaceNews*, 5 November 2019.

automatic it is."[43] The Marine Corps already has LEO constellation satellite program managers at its Combat Development Command and is participating in the DEUSCI testing. By investing in constellation satellite internet, the Marine Corps would create incentives to accelerate its realization.

LEO constellation satellite internet also provides a secure connection that can prevent an adversary from discovering information on its networks. The inherent nature of supply chains, where operational-level logistics enablers and suppliers consist of commercial and local small businesses across the United States and in partnering nations, possesses an intrinsic problem as it exposes military requirements on unclassified networks because those establishments lack proper classified access. An adversary can amass logistics information across these unclassified systems and learn of friendly military actions and intentions. Leveraging space operations to communicate on unclassified networks may help enhance information security compared to using fiberoptic cable internet. Marine leaders direct planners to execute space operations for EABO with consideration of adversary actions in the electromagnetic spectrum and cyberspace, including commercial SATCOM that the U.S. Strategic Command currently manages and that augments additional bandwidth to insufficient military SATCOM resources supporting ongoing operations. Informed SATCOM users can recognize signs of electromagnetic interference, understand potential threats, and employ mitigation measures to make their line of communication more secure than fiberoptic cable.[44] Although commercial LEO constellation satellite internet services may not be secure enough for classified military operations like targeting or ISR, it could provide enough security for military logistics command and control platforms.

Using a single source of Joint Service internet may also help enable stronger logistics synchronization to share resources in Joint operations. According to the Joint Chiefs of Staff, "the coordinated use, synchronization, and often sharing of two or more combatant commands (CCMDs) or Military Departments' logistics resources" to support Joint operations is the ideal situation for these instances.[45] If the Department of Defense can implement this new space technology as a primary internet source, it can set up the Joint forces to share the same network and become as interoperable as needed for direct-to-consumer logistics coordination. In EABO, the LLB would require more supporting relationships with Joint Services, allies, and partners for operational reach inside the WEZ.

By establishing LEO constellation SATCOM for all the branches, the DOD could potentially overhaul its internet infrastructure, creating a single network for all the Services. A computer network is a group of interconnected laptop and desktop

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[43] Brian Beal, interview with author, 8 December 2020.
[44] *Techniques for Satellite Communications*, Army Technical Publication 6-02.54 (Washington, DC: Headquarters Department of the Army, 2017).
[45] *Joint Logistics*, Joint Publication 4-0 (Washington, DC: Joint Chiefs of Staff, 2019).

computers, tablets, and other devices that send and receive data within the group.[46] Right now, each Service has its own .mil network—usmc.mil, army.mil, navy.mil, af.mil, uscg.mil, and spaceforce.mil—with each one's logistics platforms residing exclusively on it. Users can only remotely access GCSS-MC on a government computer connected to the usmc.mil network and with a virtual private network for encryption security. The logistics command-and-control platforms of the other Services have the same requirements for remote access.[47] Establishing a Joint Service network where each branch can either migrate or access each other's logistics information or C2 platforms would greatly assist any coordination efforts.

The LLB will need the ability to coordinate support from other Services in EABO, but it currently faces a major hurdle in the disjointed networks between the branches. Although the platforms are different, sharing a Joint DOD network could enable cross-communication. The Defense Information Systems Agency's Joint Information Environment that launched in 2014 demonstrates the need for "a single joint enterprise IT platform that can be leveraged for all DoD missions."[48] The Joint Information Environment attempts to solve the problem where different networks have "differing systems, policies, and lack of trust between networks," which adversely impacts "the warfighter's ability to execute joint global military operations" and increases service costs to the DOD for redundant internet infrastructure.[49] Yet, most of the Marine Corps' communication platforms, including its logistics C2 platforms, are not running on the Joint Information Environment. Even if the platforms were on the program, EABO units most likely find it inaccessible without satellite internet.

The new U.S. Space Force, established in 2019, is likely to be the future administrator of all the Joint force's space assets, including SATCOM. As the central administrator, the Space Force could enable connectivity to the Joint Information Environment. The Space Force envisions managing "a single, integrated enterprise [that] will deliver unparalleled options to joint warfighters" that can link all the branches under its supervision.[50] Using the same LEO constellation satellite internet provided to the Joint Services, the Marine Corps could increase its ability to communicate effectively with all the branches to coordinate logistics support for an EABO.

Currently, the Marine Corps and the Navy share connectivity through nonsatellite Navy-Marine Corps Intranet (NMCI), which could establish their Joint logistics coordination sooner. The Marine Corps' logistics C2 platforms could integrate with the Navy's platforms on NMCI, but currently struggle to do so because the two platforms are different. The Navy is presently working on a new logistics command and control

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[46] "Computer Network," Khan Academy, accessed 22 February 2021.
[47] "FAQs," Global Combat Support System–Army, accessed 22 February 2021.
[48] *Enabling the Joint Information Environment (JIE): Shaping the Enterprise for the Conflicts of Tomorrow* (Fort Meade, MD: Defense Information Systems Agency, 2014).
[49] *Enabling the Joint Information Environment.*
[50] *United States Space Force Vision for Satellite Communications (SATCOM)* (Washington, DC: U.S. Space Force, 2020).

platform for their Naval Operational Supply System called the Naval Operational Business Logistics Enterprise (NOBLE), a platform developed by the commercial provider One Network Enterprises that will replace all previous systems. It is a multi-party platform that consolidates all categories of supplies, from ammunition to food to retail, so that one platform supports all logistics operations.[51] Through NOBLE, the Marine Corps supposedly should have the ability to request Navy support like sea route security, explosive ordnance detonation capabilities, and shipping.[52] Having access to the same network, uninterrupted service through LEO constellation satellite internet, and an integrated C2 platform with the Navy would create expanded EABO support and interoperability.

With a similar setup throughout the Department of Defense, the Marine Corps could communicate with all the branches specific command and control platforms. To do so, however, would require an overhaul of the various systems. The U.S. Army, like the Marine Corps, currently uses Oracle's GCSS platform, called GCSS-Army. Even with the same platform from the same company, the Army and Marine Corps cannot cross-coordinate because of being on different .mil networks. The Army's Network Enterprise Technology Command manages several sources of intranet and internet connectivity, none of which is compatible with Navy or Marine Corps logistics C2 platforms.[53] The U.S. Air Force logistics platform is just as incompatible. It contracted One Network Enterprises, the same company that created the Navy's NOBLE platform, to build its own version of the platform that consolidates all supply classes to one "modern global network platform" called the Item Master Logistics Capability Initiative.[54] Similar to the situation with GCSS, the Air Force's internet platform, the Air Force Intranet, is incompatible for Navy and Marine Corps use. For the Marine Corps to coordinate logistics directly with the other Services, it needs to have access to a single Joint network on secure broadband internet provided by LEO constellation, fulfilling the Joint forces' ideal of sharing logistics in the process.

Conclusion

EABO logistics operations need LEO constellation satellite internet to effectively coordinate with the other Services over existing web-based platforms from austere locations. Unlike MEUs afloat, the MLR is not designed to be self-sustaining and instead is nested in the much larger Joint operations logistics schematic. According

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[51] One Network Enterprises, "The United States Air Force (USAF) Awards $62M Contract to One Network Enterprises for Its Item Master Logistics Capability Initiative (IMLCI)," *Cision PR Newswire*, 1 October 2020.
[52] One Network Enterprises, "The USAF Awards $62M Contract."
[53] *Army Telecommunications and Unified Capabilities*, Army Regulation 25-13 (Washington, DC: Headquarters Department of the Army, 2017).
[54] One Network Enterprises, "The United States Navy Awards $43 Million Contract to One Network Enterprises for the Naval Operational Business Logistics Enterprise (NOBLE) Naval Operational Supply System (NOSS)," *Cision PR Newswire*, 4 November 2020.

to designs for the new logistics command-and-control scenario, the MLR's smallest units in the middle of nowhere and without infrastructure must be able to immediately coordinate logistical details, from resupply of ammunition to amphibious transportation back to base, with supporting units as close as the LLB as far away as USTRANSCOM while using Marine Corps-specific C2 platforms.

The root problem to fulfilling this requirement is not for lack of technical expertise, lack of ready suppliers, or lack of anyone's effort as the Marine Corps has proven that GCSS-MC and other logistics platforms possess these qualities. Instead, the significant issue is that EABO units in isolated positions do not have reliable internet connections that allow for effective communication in the first place. Even in garrison, where infrastructure based on internet fiberoptic cable is well emplaced, platforms like GCSS-MC become slow, cumbersome, and user-unfriendly when the NMCI network stresses the internet bandwidth capacity. When deployed at sea where logistics functions are considered low priority for limited SATCOM use, Marines have the option of an offline mode for GCSS-MC until reestablishing internet access. If the root of the problem is scarcity of internet, then the solution is to get more internet.

The only way to get internet in the middle of nowhere is from satellite connections. While military SATCOM has been available for more than two decades, technological limitations of the time made it scarce, causing the military to limit its availability primarily to high-priority capabilities, such as targeting and intelligence, over supporting functions like logistics. Opportunely, the proliferation of LEO constellation satellite internet technology is growing in tandem with the advent of the Marine Corps' redesigned force. As recently as 2019, the DOD began investing in projects related to LEO constellation satellite internet. Commercial LEO constellation satellite internet technology, such as SpaceX's Starlink, promises to be available to millions of people located in places without fiberoptic cable infrastructure. LEO constellation satellite internet could resolve the problem of the Marine Corps using its logistics C2 platforms in EABO. When Marines on remote islands have LEO satellite internet and need to send their logistics requests with far-away support assets immediately, they can effectively be alone and unafraid due to having that internet access. The next generation of Marines will be operating with the most modern technology and within a new paradigm of naval warfare. A current scenario that traces a modern logistics chain supporting a platoon-size team inside the WEZ looks nothing like when Combat Logistics Battalions sent up armored truck convoys to resupply forward operating bases during Operation Iraqi Freedom just a decade ago. Instead, the scenario would have new technologies.

In such a hypothetical situation, a platoon from the Littoral Combat Team needs to extend its time occupying an uninhabited island as an expeditionary base near a contested coast and needs to immediately change the sustainment plan. In just a few

steps, a Marine on an austere island can request support to distant posts. The Marine's first step would be to open their miniature satellite receiver dish and then turning on their Wi-Fi-enabled government tablet, connecting it to the LEO constellation satellite internet assigned to their unit. Next, they would log into the CLC2S, GCSS-MC, and TCPT applications on the laptop. Last, they would submit a request for resupply of food and fuel in CLC2S, update their weapons maintenance requirements in GCSS-MC, and coordinate transportation to pick up the platoon in TCPT.

From there, these requests would automatically transact at the LLB's operations center, where supply and maintenance statuses are tracked as efficiently as the most modern commercial warehouse. The operations center would assign each request to actionable subordinate units. The maintenance office then 3D prints the requested maintenance parts and airdrops them by an Army-operated unmanned delivery vehicle to the EAB within five hours. The logistics coordination office would order food and fuel from the nearest local economy to be delivered by merchant boat. And the transportation office would update the schedules of the light amphibious warships to pick up the platoon from the EAB at the new time. Meanwhile, Marines at the EAB can continually track the status of each request because of their access to LEO satellite constellation's uninterrupted, encrypted, high-bandwidth internet. Given the possibilities of secure constant connectivity, current logistics command-and-control platforms can work well for the Marine Littoral Regiment to coordinate sustainment for EABOs.

Chapter 3

Seabasing in the Indo-Pacific Region

A Strategic Perspective

Major Nicholas S. Lybeck, USMC

In the *National Security Strategy of the United States of America* from 2017, the administration of President Donald J. Trump noted that the country is in an era of great power competition. The authors of the document stated, "China and Russia challenge American power, influence, and interests, attempting to erode American security and prosperity."[1] This strategic focus on great power competition coupled with the rebalance in Asia under President Barack H. Obama's administration had significant implications for diplomatic, information, military, and economic instruments of national power. The pivot to great power competition and the new regional focus in the Indo-Pacific resulted in the formation of a new naval operating concept designed to deter and defeat peer adversaries. As expeditionary advanced base operations (EABO) are implemented in the Indo-Pacific region, the requirement to seabase will increase. *Seabasing* refers to "the deployment, assembly, command, projection, reconstitution, sustainment, and re-employment of joint power from the sea without reliance on land bases within the operational area."[2] The United States must implement a seabasing strategy that increases the speed and volume of wartime materiel delivered from ship to shore, improves interoperability with allies and partners through training exercises and development of a logistics common operating picture, and employs economic statecraft to increase access and strengthen infrastructure to support seabasing in the Indo-Pacific region. Yet, the question here is how will seabasing change as EABO is implemented in the Indo-Pacific region?

As the size of China's Navy surpasses the U.S. Navy, interoperability and integration with regional allies will be essential when developing responses to Chinese aggression, which requires the United States to embrace closer partnerships with these allies through a whole-of-government approach to strategy development. General David H. Berger, the 38th Commandant of the Marine Corps, reiterates this point by arguing that "by developing a new expeditionary naval force structure that is not dependent on concentrated, vulnerable, and expensive forward infrastructure and platforms, we have to frustrate enemy efforts to separate U.S. Forces from our allies and interests."[3] Seabasing frees the United States from a reliance on expensive forward infrastructure, such as permanent overseas bases, but it can also have a negative effect on relationships with allies and partners in the

[1] *National Security Strategy of the United States of America* (Washington, DC: White House, 2017), 2.
[2] *Amphibious Operations*, Joint Publication 3-02 (Washington, DC: Joint Chiefs of Staff, 2019), GL-20.
[3] Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019), 11.

region. Any lack of a permanent presence from the United States, accomplished partly through overseas bases, can cause its allies and partners to question its commitment to those regions. Without a clear strategy that counters China's antiaccess/area-denial (A2/AD) threats, fosters improved interoperability with allies and partners for seabasing, and improves strategic access that enables seabasing through greater economic investment in infrastructure and technology transfers, the United States may be partly responsible for creating a separation between itself and its allies and interests.

With the current and future threat environment that A2/AD technology and strategies pose amid a growing Chinese Navy, seabasing will become a necessary application in a range of military operations, but faces multiple current challenges. Historically, interoperability, as seen through the American-British-Dutch-Australian (ABDA) Command (ABDACOM) during World War II, has played a critical role in coalition warfare and is important to interoperability during multinational and seabasing operations. The role and application of economic statecraft by the United States is significant to enabling seabasing and in combating China's growing influence through its application of coercive economic statecraft. This chapter will offer recommendations to successfully implement a seabasing strategy to fight and win in an A2/AD environment.

China, A2/AD, and EABO

After the Cold War and the fall of the Soviet Union, the United States enjoyed the advantage of assured sea control and access. More recently, the proliferation of A2/AD weapons and expansionist countries competing with the United States for power eroded its competitive advantages. When defining A2/AD, Nathan Freier, a senior fellow in the International Security Program at the Center for Strategic and International Studies in Washington, DC, observes that antiaccess and area denial cover separate issues despite them often being lumped together. On the one hand, antiaccess challenges preclude the entrance of the United States into a foreign theater or deny effective use and transit of the global commons, which can include the use of long-range lethal instruments like antiship cruise missiles, ballistic missiles, submarines, weapons of mass destruction, and offensive space and cyberspace assets. On the other hand, area denial challenges tend to restrict freedom of maneuver of U.S. forces once they have arrived.[4] However it is defined, A2/AD technology presents a formidable threat to the ability of the United States to gain and maintain sea control.

The People's Republic of China continues to proliferate and develop A2/AD capabilities in the Indo-Pacific region. Chinese threats to access have become more sophisticated in recent years and are part of a broadened package including more than technology. While the United States maintains a strong advantage in certain war-

[4] Nathan Freier, "Emerging Anti-Access/Area-Denial Challenge," Center for Strategic and International Studies, 17 May 2012.

fare domains, China holds a decisive advantage in missile strike warfare and antiship cruise missiles.[5] In addition to militarizing islands within the first and second island chains—the two lines of islands between Japan and the Philippines and Micronesia, the People's Liberation Army developed the Dong-Feng 21 medium-range ballistic missile, designed to specifically destroy U.S. aircraft carriers and having an operational range estimated at approximately 1,770 kilometers. China's growing navy is also of great concern. China's People's Liberation Army Navy (PLAN) will likely possess twice as many warships and submarines as the U.S. Navy along with a robust maritime intelligence capability, representing a significant threat to U.S. naval operations in the region.[6] As China's fleet is mostly located in the Indo-Pacific region while the U.S. Navy remains committed throughout the globe, it and the Marine Corps can expect to fight its way into and then operate in contested maritime domains.

In response to the great power competition, the U.S. Navy and Marine Corps have developed naval operating concepts designed to operate against and defeat its adversaries within these environments. Littoral operations in a contested environment (LOCE) and EABO are operating ideas that recognize the dangers and importance of littoral regions to sea control and advocate for a persistent forward presence to gain an advantage against adversaries.[7] Specifically, EABO is a Joint Navy and Marine Corps model that supports both the Joint force maritime component and fleet commanders in the fight for sea control by employing precision and long-range fires on key maritime terrain to create an A2/AD environment in close and confined seas.[8] Forward-deployed forces are intended to act as deterrents or to quickly respond to aggression or crises. Seabasing, in this case representing at-sea logistics, is a critical enabler of forward postured forces. As a global maritime power, the United States faces adversaries that possess an advantageous position in close proximity to their territory. The addition of new long-range precision missiles has created a landward dimension that produces greater complexity in naval operations.[9] This operating environment challenges old assumptions of sea control and access while demanding new means, methods, and competencies in naval combat.[10]

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[5] Lyle Goldstein, "The US-China Naval Balance in the Asia-Pacific: An Overview," *China Quarterly* 232 (December 2017): 912, https://doi.org/10.1017/S030574101700131X.
[6] James Fanell, "China's Global Naval Strategy and Expanding Force Structure: Pathway to Hegemony," *Naval War College Review* 72, no. 1 (Winter 2019): 48–50, https://digital-commons.usnwc.edu/nwc-review/vol72/iss1/4.
[7] Fanell, "China's Global Naval Strategy and Expanding Force Structure," 48.
[8] Arthur Corbett, *Expeditionary Advanced Base Operations (EABO) Handbook* (Quantico, VA: Marine Corps Warfighting Lab, 2018), 5.
[9] *Littoral Operations in a Contested Environment* (Washington, DC: Department of the Navy and Headquarters Marine Corps, 2017), 5.
[10] Corbett, *Expeditionary Advanced Base Operations (EABO) Handbook*, 11.

Seabasing: Definition, Application, and Challenges

While doctrine sets a starting point to understand seabasing, it is more helpful to think about seabasing as "having a *base* at sea: a port, an airfield, maintenance facilities, and command and control [C2]" as well as sustainment capabilities.[11] Seabasing enables naval forces to project combat power ashore and to sustain landward forces from the sea base if the tactical situation permits. Numerous units and elements, including Carrier Strike Groups (CSG), Marine Expeditionary Units, and Maritime Prepositioning Ships Squadrons, among other programs in the other Services, can contribute to seabasing, which may also involve Joint and coalition forces.[12]

Although seabasing as a military concept does not have a defined beginning, campaigns in the South Pacific during World War II birthed the current concept of operating from a seabase. The U.S. Navy devised a system of advanced bases, shore-based facilities that stored the provisions necessary to prosecute a long-distance war, and mobile bases designed around the Service Squadron. The Service Squadron provided support to the battle fleet, carrying supplies, such as fuel, ammunition, food, and repair supplies, and allowing for underway replenishment.[13] Experts have intensely debated the topic of seabasing since the Cold War ended.[14]

According to Commander Gregory J. Parker, the intense discussions about seabasing occurred during a time when the United States had assumed relative sea control after the Soviet Union collapsed in 1991 and it no longer faced any serious maritime threats.[15] Notably, in the last 20 years, the current version of seabasing evolved primarily as a result of crisis response conditions with disaster relief and humanitarian assistance operations.[16] For example, when a massive earthquake measuring 7.3 on the Richter scale struck Haiti on 12 January 2010, it produced catastrophic damage to infrastructure and human life, causing over 500,000 total casualties with over 150,000 deaths and leaving over 1 million homeless. By the next day, U.S. Southern Command launched Operation Unified Response and the United States sent the USS *Carl Vinson* (CVN 70), members of the 22d Marine Expeditionary Unit, and the maritime prepositioning ship USNS *Lummus* (T-AK 3011), which carried U.S. Agency for International Development (USAID) materiel as well as Department of Defense disaster relief supplies.[17] The earthquake caused severe damage to Haitian infrastructure and created an antiaccess

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[11] Cdr Gregory J. Parker, *Seabasing since the Cold War: Maritime Reflections of American Grand Strategy* (Washington, DC: Brookings Institute, 2010), 53.
[12] *Concept of Employment for Current Seabasing Capabilities: Integrating Seabasing Capabilities into Exercises and Experiments* (Norfolk, VA: U.S. Fleet Forces Command, 2010), 5.
[13] Maj Jose A. Gonzalez, USMC, "Sustainment of Expeditionary Forces in the Pacific Theater during the Second World War: The Development of the Advanced Base and Mobile Base Programs and Their Relevance Today" (master's thesis, U.S. Marine Corps Command and Staff College, 2013), 21–23.
[14] For more on this debate, see Parker, *Seabasing since the Cold War*, 4–10.
[15] Parker, *Seabasing since the Cold War*, 6.
[16] Maj Gen Thomas A. Benes, USMC (Ret), "Seabasing Development: Past Lessons and Future Opportunities," *Marine Corps Gazette* 95, no. 12 (December 2011): 36–37.
[17] *Concept of Employment for Current Seabasing Capabilities*, 13.

environment that prevented the ships from anchoring at the port of Port-Au-Prince, which compelled the forces ashore to rely on support from the seabase. While the Haitian earthquake represented an environmental A2/AD threat, China continues to rapidly develop and refine a complex A2/AD threat that challenges American access to the Indo-Pacific region.

China's rising navy and rapid technological developments enable the expansion of A2/AD strategies from far greater distances from land. Sea control efforts, including assured communications, are now heavily contested, making seabasing a vital capability in EABO despite technological advancements. The current and future operating environment and strategic context, however, will place demands on seabasing that require a novel strategic perspective.

While the U.S. Navy continues to innovate to reduce the time it takes to off-load materiel, its allies and partner navies augment these efforts. The Navy's Maritime Prepositioning Force (MPF), a program of at-sea vessels designed to transport equipment and supplies enabling the rapid deployment and sustainment of combat formations ashore, is a form of seabasing and constitutes a sustainment base at sea. The MPF "strategically places military equipment and supplies onboard ship in key ocean areas to ensure rapid availability during a major theater war, humanitarian operation, or other contingency," with vessels that can off-load pier side in ports or loiter off shore as part of a larger seabase and discharge cargo and supplies.[18] Despite these capabilities, the MPF faces operational limitations, starting with its scale and speed. While the MPF enables rapid deployment of forces into theater, it can take up to a week to off-load its supplies. Timelines are dependent on sea state and weather when conducting an off-load in the open ocean using vessels that transport warfighting materiel from a ship to a secure beach.[19] Fixed infrastructure like ports and airfields that can facilitate an off-load from MPF ships are likely known targets for adversary cruise and ballistic missile attacks. As such, the timely off-loading of equipment in a conflict zone reduces risk both to a force and to a mission while maintaining operational tempo in the Indo-Pacific region.

Given the current challenges that the MPF fleet's off-loading speed and the volume of supplies generates for seabasing, advanced bases and port facilities will play an important role in sustaining operations in the Indo-Pacific region. Specifically, the proliferation and low-cost of drone technology coupled with long range precision ballistic missiles create significant risk to any seabasing vessels, including the MPF ships, the longer they loiter to dispense their supplies and cargo. While MPF vessels are meant to operate independently of ports and airfields for short periods of time, they are not designed to support large-scale combat operations in the Indo-Pacific region without relying on advanced bases and port facilities, which can affect repairs on vessels, and store extensive amounts of fuel, ammunition, and other critical supplies.

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[18] *2020–2021 Handbook* (Norfolk, VA: Military Sealift Command, U.S. Navy, 2020), 28.
[19] Parker, *Seabasing since the Cold War*, 55.

Additionally, as recently as 2018, exercises demonstrated that air and surface connectors did not push the necessary volume of materiel ashore to support simulated combat operations.[20] Numerous factors affected the supportability of these maneuvers, including the distance of the seabase from the shore and thus the time required to deploy supplies ashore, and the number of landing craft available to transport materiel from a ship to a secure beach. U.S. Joint doctrine recognizes the vital importance of speed and efficiency during multinational operations with one publication stating that "efficiency is directly related to the amount of resources required to deliver a specific outcome."[21] The U.S. Navy must find a way to overcome the problems of speed and volume to properly support forces spread over vast distances.

To operate in a maritime domain punctuated by a rising Chinese Navy and long-range ballistic missiles requires ground and sea forces to maneuver in a distributed manner and to concentrate forces to mass fires. In the event of a conflict in the Indo-Pacific region, maneuvering in and supporting ground forces in such an environment will exacerbate already-stretched U.S. Navy resources. For example, the Strait of Malacca between the Indonesian island of Sumatra and the Malaysian Peninsula represents a vital maritime choke point for the world's shipping industry. A conflict would include the deployment of ground forces in Indonesia, which comprises more than 6,000 inhabited islands, to secure shipping lanes and establish sea control.[22] Such a scenario would present a significant logistical challenge for the U.S. Navy.

The Department of Defense is aware of the Navy's warfighting disadvantage in the South China Sea. In December 2020, the DOD submitted a document revising the 30-year Navy shipbuilding plan scheduled to start in fiscal year 2022 that called for the Navy to grow from a desired end strength of 355 ships to more than 400 ships by 2045.[23] Yet, continued funding to increase the Navy's size is uncertain for several reasons. The COVID-19 pandemic resulted in a dramatic increase in the national deficit of the United States and current domestic policy issues for President Joseph R. Biden's administration risk diverting funding from defense programs and resource requests. Allies and partnerships have increased in importance as the U.S. Navy has lost the numerical and technological margins that traditionally favored it, and the nation diverts resources for supporting a swift maritime response to crises in the Indo-Pacific region to other priorities.[24] Previous conflicts, especially World War II, provide lessons for modern coalition maritime operations to improve interoperability among navies during a conflict against a peer adversary.

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[20] Maj Robert A. Fairley, USN, "Seabasing Integration: Not Just for Fair Winds and Following Seas," *Marine Corps Gazette* 102, no. 8 (August 2018): 76.
[21] *Logistics in Support of Multinational Operations*, Joint Publication 4-08 (Washington, DC: Joint Chiefs of Staff, 2017), I-6.
[22] "Facts and Figures," Embassy of the Republic of Indonesia, Washington, DC, accessed 21 January 2021.
[23] Ronald O'Rourke, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress* (Washington, DC: Congressional Research Service, 2022).
[24] Seth Cropsey, *Seablindness: How Political Neglect Is Choking American Seapower and What to Do about It* (New York: Encounter Books, 2017), 267.

ABDACOM:
A Historical Case for Maritime Interoperability during Conflict

Coalition warfare enables nations to share the burden of fighting, enhance the legitimacy of the operation, and increase the chances of victory by applying more resources to the war effort.[25] Although, to be effective, nations and multinational forces must be familiar and well-versed in how each other conducts operations, making it imperative for these nations to be interoperable. The American-British-Dutch-Australian Command during World War II demonstrates the pitfalls of not having trained together and not having developed common standard operating procedures before engaging in campaigns.

In January 1942, Allied forces created ABDACOM to defend the former Dutch East Indies—now the nation of Indonesia—from Japanese expansion, marking the first operational-level command of World War II.[26] Although ABDACOM only operated for a little more than a month, several factors limited its operational effectiveness. First, the nations were assigned limited areas of operation within the command region. This strict division negatively affected unity of command, coordination of actions, and hindered the establishment of an Allied strike force that could quickly hit Japanese weak points as they were identified.[27] Second, several restrictions were placed on Field Marshal Sir Archibald P. Wavell, the British commander of ABDACOM, which reduced his authority to solely coordinating actions rather than directing them.[28] Last, the establishment of ABDACOM occurred with little advanced planning. The ad hoc nature of its creation led to unfamiliar tactics, techniques, and procedures, pushing the command to overcome these hurdles in stride while fighting the Japanese. Though allied and partner navies can go a long way to help the U.S. Navy overcome its deficiencies with the MPF program, ABDACOM demonstrates that the Service must train with other seabasing and support fleets in peacetime to gain familiarity and establish command-and-control procedures.

The importance of developing an understanding of tactics, techniques, and procedures as well as standard operating procedures remain relevant in the future operating environment. The authors of the 2018 *National Defense Strategy* recommend prioritizing "requests for U.S. military equipment sales, accelerating foreign partner modernization and ability to integrate with U.S. forces" to "deepen interoperability" among allies and partners.[29] Indeed, the last two decades witnessed an increase in exercises designed to improve interoperability.

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[25] Patricia Weitsman, "With a Little Help from Our Friends?: The Costs of Coalition Warfare," Origins: Current Events in Historical Perspective, January 2009.
[26] Maj Rene W. A. van den Berg, RNA, "Unchained Interests: American-British-Dutch-Australian Command 1942" (master's thesis, U.S. Army Command and General Staff College, 2014), 2.
[27] van den Berg, "Unchained Interests," 58.
[28] van den Berg, "Unchained Interests," 44.
[29] *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018), 9.

Despite this emphasis on interoperability, the current Department of Defense exercise construct does not provide sufficient training opportunities for multinational forces to improve seabasing interoperability. Exercise Freedom Banner, the only annually funded MPF exercise in the Pacific, is a centerpiece for the U.S. Navy and Marine Corps in MPF concept validation, doctrinal development, experimentation, and seabasing integration.[30] Although several other exercises involve the use of MPF vessels, such as Exercise Rim of the Pacific and Talisman Sabre, many of the objectives of these drills do not include improving seabasing interoperability with any participants. For many of these maneuvers, the Navy and Marine Corps forces off-load equipment from MPF shipping to improve their ability to support operations from a seabase and onto a beachhead. However, they miss out on opportunities to improve interoperability by not creating scenarios where allied navies support U.S. forces ashore. Additionally, leveraging allied landing craft to assist with off-loading material from seabased vessels builds familiarity with standard operating procedures and will improve the speed and volume of off-loading supplies. In short, allied and partner landing craft can offset the current deficiencies of MPF ships. While training opportunities must include a greater emphasis on allied seabasing integration, multinational forces reminiscent of ABDACOM require visibility of the status of supplies available to support forces ashore and afloat to enable effective command and control.

Importance of a Logistics Common Operating Picture

A seabasing strategy that improves interoperability with Indo-Pacific allies and partners should prioritize the development of a common logistics operating picture that is compatible with all entities' C2 systems. The challenges that General Wavell faced during his command of ABDACOM were anchored in the degree of C2 that the Allied force was willing to cede to the coalition commander. Indeed, command and control is the most contentious aspect of coalition warfare.[31] Joint doctrine again provides insight into how forces are supported in multinational operations. While sustainment is a national responsibility, multinational force commanders are accountable for logistics in support of multinational operations. According to this doctrine, partner nations are encouraged to "cooperatively share the provision and use of logistics capabilities and resources to support the force effectively and efficiently."[32] Any multinational force commander requires visibility and transparency of available logistics resources to plan effective operational support. The lack of a common logistics information system that

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[30] Maj Robert Barber, USMC (Ret), and Maj Christopher Wolfe, USA (Ret), "Increasing Seabasing: Interoperability in the Pacific," *Marine Corps Gazette*, web ed. (October 2017): WE5.
[31] Anthony Rice, "Command and Control: The Essence of Coalition Warfare," *Parameters* 27, no. 1 (Spring 1997): 152, https://doi.org/10.55540/0031-1723.1817.
[32] *Logistics in Support of Multinational Operations*, I-7.

provides real-time information to multinational forces prevents achieving this necessity for these campaigns, making it a stumbling block to seabasing and logistics operations in a multinational environment.[33] The requirement for a logistics common operating picture and the challenges of command and control of multinational forces are not unique to the Indo-Pacific region.

As early as 2018, the North Atlantic Treaty Organization (NATO) wrestled with the challenges associated with C2 and a common operational picture. In June 2016, amphibious leaders from France, Italy, the Netherlands, Portugal, Spain, the United Kingdom, and the United States convened at the inaugural Amphibious Leaders Expeditionary Symposium (ALES) to discuss a U.S.-European amphibious force to improve interoperability.[34] In response to the questions concerning command and control for maritime operations in support of NATO that ALES posed, Marine Forces Europe and Africa asked Rand to design and facilitate three events aimed at identifying suitable C2 constructs for large-scale maritime operations against a peer competitor.[35]

These events highlighted several questions pertaining to how NATO and maritime forces can achieve a common operating picture with no ready answers. Indeed, while NATO seeks to "generate effective and responsive multinational logistic command and control and communications and information systems capabilities and arrangements in support of NATO operations," no such logistics common operating picture exists to provide real-time logistics information to enable effective seabasing command and control.[36] A multinational force operating against a peer enemy in a contested EABO environment needs to maximize mutual support and shared sustainment to provide maximum flexibility for the commander.

Economic Statecraft to Enable Seabasing and Access

In addition to efforts to grow A2/AD technology in the Indo-Pacific region, China is using coercive economic statecraft as part of a larger strategy to frustrate U.S. access there. Current discussions on A2/AD have driven the discourse away from strategy and almost exclusively toward force structure and tactics.[37] An A2/AD strategy incorporates military, political, and economic objectives and recognizes that perceived weaker states

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[33] Maj Gen Rodney Fogg, AUS Army, et al., "Interoperability: Embrace It or Fail!," U.S. Army, 10 February 2020.
[34] The Amphibious Leaders Expeditionary Symposium is "a forum for general and flag officers to discuss opportunities for improved interoperability, command and control, and utilization of amphibious forces within NATO." Gene Germanovich et al., *NATO's Amphibious Forces: Command and Control of a Multibrigade Alliance Task Force* (Santa Monica, CA: Rand, 2019), ix, https://doi.org/10.7249/RR2928.
[35] Germanovich et al., *NATO's Amphibious Forces*, ix.
[36] *NATO Logistics Handbook* (Brussels, Belgium: North Atlantic Treaty Organization, 2012), 39.
[37] Sam J. Tangredi, "Antiaccess Warfare as Strategy: From Campaign Analyses to Assessment of Extrinsic Events," *Naval War College Review* 71, no. 1 (Winter 2018): 39.

can use nonkinetic means to cause the superior nation to give up the fight.[38] For example, during the Persian conflict with the Greeks in 480–479 BCE, the Athenians fomented a revolt within the borders of the Persian Empire under the rule of Xerxes that caused him to end his efforts. In this case, the Athenians (the weaker state) employed an A2/AD strategy using nonkinetic means (stoking unrest within Xerxes' borders) to deny access to the Persians (the stronger state) and prevent their conquest of Greece.[39] China wields heavy economic weight and can induce nations to conform to its demands.

China is also competing at the strategic and operational levels through economic influence. Beijing, for instance, implemented economic sanctions against multiple South Korean industries following that nation's decision to allow the placement of the U.S. Terminal High Altitude Area Defense System on the peninsula.[40] On top of its ability to apply economic coercion to its regional neighbors, China is employing *geoeconomics*—defined as "the use of economic instruments to accomplish geopolitical objectives"—to limit U.S. influence and access to infrastructure required to effectively seabase and employ MPF vessels.[41] China's Belt and Road Initiative (BRI), which China's president Xi Jinping first launched in 2013, is an example of geoeconomics in the region. Meant as a network of "road and sea connections between China and countries in Southeast Asia, Central Asia and through to Europe," China plans to achieve this goal with "massive investment in infrastructure, including roads, rail, airports, ports, pipelines, and communications."[42] Through its BRI and "String of Pearls" strategy, China is focused on increasing its economic, military, diplomatic, and political influence in the region through port projects and foreign direct investments in the region.[43] This maritime march across the Indo-Pacific has eroded the influence of the United States and deepened the interconnectedness between China and other Indo-Pacific nations.

While not representative of all Indo-Pacific nations, Indonesia's relationship with the United States and China is also not unique. Indonesia's delicate relationship with China is marked by deep economic interconnectedness, through initiatives like the BRI, and strategic mistrust.[44] Its tenuous relationship with China, coupled with its role as founder and leader of the Non-Aligned Movement, has prevented Indonesia from

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[38] Tangredi, "Antiaccess Warfare as Strategy," 33.
[39] Tangredi, "Antiaccess Warfare as Strategy," 39.
[40] Christine Kim and Ben Blanchard, "China, South Korea Agree to Mend Its Ties after THAAD Standoff," Reuters, 30 October 2017; and Vinod K. Aggarwal and Andrew W. Reddie, "New Economic Statecraft: Industrial Policy in an Era of Strategic Competition," *Issues and Studies* 56, no. 2 (June 2020): 10, https://doi.org/10.1142/S1013251120400068.
[41] Robert D. Blackwill and Jennifer M. Harris, "The Lost Art of Economic Statecraft: Restoring an American Tradition," *Foreign Affairs* 95, no. 2 (March/April 2016): 99.
[42] Joshua P. Meltzer, "China's One Belt One Road Initiative: A View from the United States," Brookings Institute, 19 June 2017.
[43] Junaid Ashraf, "String of Pearls and China's Emerging Strategic Culture," *Strategic Studies* 37, no. 4 (Winter 2017): 169.
[44] Ben Dolven and Bruce Vaughn, *Indo-Pacific Strategies of U.S. Allies and Partners: Issues for Congress* (Washington, DC: Congressional Research Service, 2020), 26.

developing closer ties to the United States.[45] The BRI and String of Pearls strategy has provided additional locations that allow the PLAN to operate as well. For example, China assumed ownership over Sri Lanka's Hambantota port, which is approximately six nautical miles away from the Indian Ocean's major east-west shipping route and providing a potential base of operations for the PLAN, after Sri Lanka defaulted on its loan.[46] As China increases its influence and interconnectedness through port investments, the United States must also grow its investment in regional ports.

Allied efforts in the Indo-Pacific region during World War II offer a strong example of the importance ports play in prosecuting a maritime operation there. The Guadalcanal campaign in 1942 highlighted the criticality of significant ports and advanced bases to support the immense supply requirements for combat operations. During the campaign, the U.S. Marine Corps experienced supply challenges that stemmed from the lack of capacity at Noumea in New Caledonia, roughly 730 nautical miles southeast of Guadalcanal. At Noumea, facilities lacked the ability to off-load and transfer equipment. At one point, as many as 86 ships were waiting to be serviced in Noumea harbor.[47] Planners learned from Guadalcanal and began to select objectives of logistical value such as ports, harbors, sheltered anchorages, and airfields that allowed the Allied forces to establish advanced bases to act as forward and supply staging points for the remainder of the Pacific campaigns (figure 17).[48] These advanced bases enabled the creation of an intricate network of distribution lines that increased responsiveness and speed, overcoming many of the challenges experienced in the early stages of the Pacific operations.

Today and in any future conflicts in the Indo-Pacific region, ports play a vital role in maritime campaigns. Ports enable the buildup of combat power and the resources required, such as fuel and ammunition, to enable combat operations and the repair of damaged vessels. Off-loading equipment from U.S. MPF ships at existing port facilities "is the quickest and most efficient method. During a pier side offload, all vehicles are driven off the ship's ramp and containers are lifted using the ship's or host nation's cranes."[49] Papua New Guinea is and, during the Second World War, was an important partner in the South Pacific. Due to their strategic location near Australia, being a key ally in the region, and its distance from China, Papua New Guinea, and its six major ports within 40.2 kilometers of an airstrip or airport, offers the U.S. Navy alternate advanced base options that remain outside of the range of China's DF-21 ground-based antiship ballistic missiles (figure 18). Airstrips and airports located close to ports facilitate the transportation of supplies to other areas and to facilitate the

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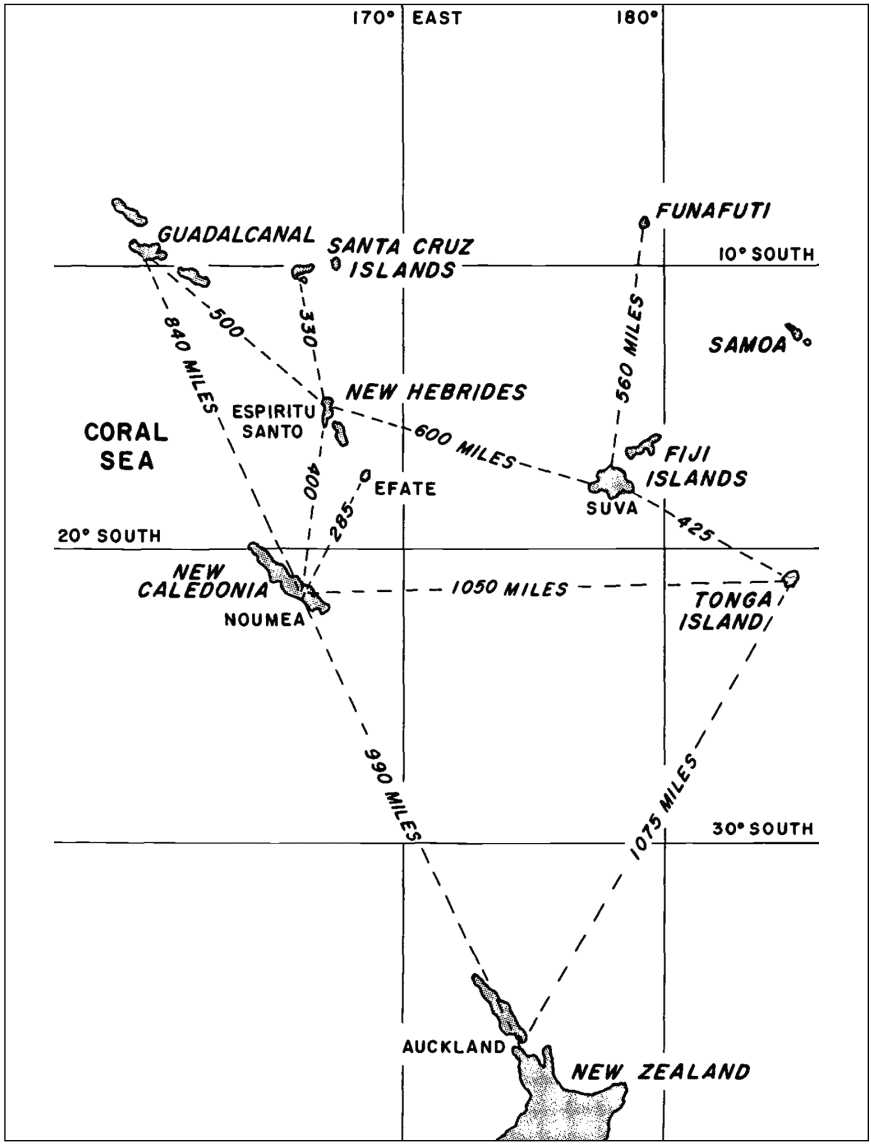
[45] Dolven and Vaughn, *Indo-Pacific Strategies of U.S. Allies and Partners*, 25.
[46] Ashraf, "String of Pearls and China's Emerging Strategic Culture," 170.
[47] Gonzalez, "Sustainment of Expeditionary Forces in the Pacific Theater during the Second World War," 18.
[48] Gonzalez, "Sustainment of Expeditionary Forces in the Pacific Theater during the Second World War," 20.
[49] *Maritime Prepositioning Force Operations*, Marine Corps Warfighting Publication 3-32 (Washington, DC: Headquarters Marine Corps, 2004), 5-14.

Figure 17. World War II advanced base locations, Pacific campaign



Source: VAdm George Carroll Dyer, USN (Ret), *The Amphibians Came to Conquer: The Story of Admiral Richmond Kelly Turner*, vol. 1 (Washington, DC: Headquarters Marine Corps, 1991), 418.

fly-in of forces that can be embarked aboard ships within the region. The desirable distance from port to airfield is less than 80.5 kilometers to both ensure efficient

Figure 18. Major ports near C-130 and C-17-capable airfields, Papua New Guinea

Source: Maj Nicholas S. Lybeck, USMC, adapted by MCUP.

travel between the two nodes and decrease local area security requirements.[50] The port facilities in Papua New Guinea possess key characteristics for these requirements at the six main ports (table 5).

While these six port facilities can accommodate some U.S. Navy vessels, only three port facilities can support the majority of the Navy's Military Sealift Command fleet. The Military Sealift Command is "responsible for 125 civilian-crewed ships that replenish U.S. Navy ships at sea, conduct specialized missions, preposition combat cargo at sea perform a variety of support services, and move military equipment and supplies to deployed U.S. forces around the world."[51] According to the command's 2020–21 handbook, the average draft of their large ocean transportation fleet, including MPF, Combat Logistics Force, and sealift vessels, is 35 feet.[52] Of the three ports in Papua New Guinea with sufficient cargo berth depth that can support MSC's fleet of large vessels—Port Moresby, Lae Port, and Kimbe Port—only Port Moresby and Lae Port can support vessels with drafts of 35 feet or more and vessels 500 feet or larger, which is the preponderance of MSC's large ocean transportation fleet. Additionally, Port Moresby has a container yard suitable for storing off-loaded containers and cargo.

[50] *Maritime Prepositioning Force Operations,* 13-11.
[51] *2020–2021 Handbook*, 2.
[52] *2020–2021 Handbook*, 29–53.

Table 5. Papua New Guinea major port characteristics

Major port*	Number of berths**	Cargo berth depth**	Max vessel size	Container terminal**	Nearest airport	Distance from port to airport	Run-way***	Runway length ***
Kimbe	3	18–35 feet	500 feet	No	Hoskins	38.6 kilometers	Paved	5,200 feet
Lae	3	36–40 feet	500+ feet	No	Nadzab	40.2 kilometers	Paved	7,900 feet
Madang	3	10–33 feet	500+ feet	Yes	Madang	9.7 kilometers	Paved	5,100 feet
Port Moresby	4	10–40 feet	500+ feet	Yes	Jacksons	14.5 kilometers	Paved	9,000 feet
Rabaul	2	26–30 feet	500+ feet	Yes	Tokua	40.2 kilometers	Paved	5,600 feet
Wewak	3	21–25 feet	500 feet	No	Boram	3.2 kilometers	Paved	5,200 feet

Source: *-CIA World Fact Book data; **-port information collected from PNGPorts.com; ***-Global Security data. Table created by the author.

The off-load capability of a port, such as pier space and width, container yards that offer suitable staging and covered storage areas, and available cranes among others, is a key factor in selecting a port.[53] While Port Moresby is the most promising facility, it is also Papua New Guinea's largest and most trafficked port and the government of Papua New Guinea likely would be disinclined to allow the U.S. Navy full use of it due to its economic role.

Rabaul Port on the north side of the island of New Britain offers a strong alternative to Port Moresby due to its location and characteristics making it viable for an advanced naval base in the event of conflict in the region. Rabaul is located in a lightly populated region and, although important to New Britain's economics, has a smaller economic role to Papua New Guinea. Its physical characteristics and location offer good protection from adversary navies and favorable terrain for ground forces, such as the Marine Littoral Regiment (MLR), to deploy antiship and antiair defenses. Specifically, the island of New Ireland provides protection to the northeast of Rabaul as well as deployment options for antiship and antiair defenses from the MLR. Compared to the location of Port Moresby and Lae Port in large urban areas, the relatively small popu-

[53] *Maritime Prepositioning Force Operations*, 13-2.

lation of Rabaul—3,385 people as of 2000—would alleviate some of the force protection requirements to protect the facility, personnel, and war materiel staged there.[54] While Rabaul Port does not currently have the depth necessary to support most of the MCS's large ocean transportation fleet, its features make it a strong candidate for U.S. investment to make it suitable for the Navy to use as a cooperative security location.

Industrial policy is also significant to a seabasing strategy that can improve EABO concepts of logistics support and distributed maritime operations in the Indo-Pacific region.[55] During the Guadalcanal campaign, the vast majority of warfighting materiel came from the shores of the United States, more than 6,083 nautical miles away. Diversifying supply chains through overseas manufacturing of critical defense systems in the territory will reduce the distance between the warfighter and their supply source. For example, L3Harris, a major defense contractor, recently established a headquarters in Australia where it will "expand further into prototyping systems integration" for supporting C2 systems for the Australian Defense Force.[56] Additionally, Boeing recently delivered Australia's first unmanned jet-powered drone that uses artificial intelligence, noting it was also the first aircraft "to be designed, engineered, and manufactured in Australia in more than 50 years."[57] With the proliferation of long-range weapons systems and the availability of low-cost A2/AD technology, unmanned aircraft systems (UAS) provide a critical capability to find and fire on an adversary first in future conflicts.

Recently, the Defense Innovation Unit of the Department of Defense announced the availability of five U.S.-manufactured small UAS systems to provide the government secure intelligence, surveillance, and reconnaissance. This initiative provided substantial funding to approved manufacturing firms to build a robust and trusted small UAS domestic industrial base that offers alternatives to Chinese-made drones.[58] While domestic manufacturing of small UAS improves supply chain and manufacturing security, it also creates extended distribution lines. A network of developed sources of supply with regional allies and partners can provide warfighters timely and effective sustainment for systems that will be in high demand in the next conflict with a peer or near-peer competitor.

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[54] *Encyclopaedia Britannica Online*, Academic ed., s.v. "Rabaul, Papua New Guinea," accessed 15 February 2021.

[55] *Industrial policy* refers to "government intervention in a specific sector which is designed to boost the growth prospects of that sector and to promote development of the wider economy." See Uri Dadush, "Industrial Policy: A Guide for the Perplexed," Carnegie Endowment for International Peace, 1 February 2016.

[56] "New Harris Defence Australia HQ Digitises the Battlefield," CriticalComms.com.au, 31 January 2018.

[57] Brad Lendon, "Australian Military Gets First Drone that Can Fly with Artificial Intelligence," CNN, 5 May 2020.

[58] "Defense Innovation Unit Announces sUAS Product Availability to Provide Secure, Capable Small Unmanned Aerial Systems for Critical Uses Across the Government: Culmination of an 18-Month Effort Will Spur Stronger U.S. Drone Industrial Base for Future Innovation," Department of Defense, 20 August 2020.

Recommendations

For seabasing to remain a viable concept in the coming decades, the United States must improve access to and interoperability with partners and allies. While investments in technology and modernization efforts will help improve the U.S. Navy's ability to operate from a seabase, recommendations to improve a modern seabasing concept must include a whole-of-government approach. The following recommendations will require close coordination with other instruments of national power, such as the Department of State, and could achieve important diplomatic, information, and economic goals.

First, the United States must increase and improve training opportunities with allied and partner logistics and seabasing fleets to increase interoperability. The regional allies and partners of the United States have an important role to play in offsetting the demands placed on the Navy in an EABO environment. It will need every ally in a future conflict in the Indo-Pacific region and the lessons learned from ABDACOM demonstrate the importance of unity of command and mutual support. The Navy and Marine Corps should assess the current Indo-Pacific exercise construct to determine whether objectives aimed at logistics interoperability to support multinational forces ashore are being achieved.

Second, the United States should, along with NATO, develop a maritime logistics common operating picture. Global logistics awareness, a U.S. Marine Corps concept to sustain combat power in contested environments, aims to rapidly and accurately "identify warfighter requirements, assess friendly force posture, determine available resources, and allow for dynamic and adaptive fulfillment planning."[59] What is needed at the operational and strategic level is total visibility of what a coalition navy has in its inventory. Coalition maritime operations during conflict require interoperable automated logistics information systems that communicate with coalition partners and allies to maximize flexibility in determining viable sourcing solutions. Efforts to improve interoperability and develop an integrated logistics common operating picture requires nations to spend money, take risk, and cede sovereignty and would likely be viable in the long-term.

Third, the United States should have greater use of economic statecraft and geoeconomics to improve maritime access in the Indo-Pacific region through infrastructure investment and overseas manufacturing. The United States must strengthen its partnership network and seek to blunt China's efforts to separate the United States from partnerships in the region. In addition to China's BRI, "our competitors already have taken advantage of many exposed partnership nodes, especially using arms transfers such as the recent sale of Russian S-400 air defense systems to Turkey" that degrade traditional alliance

[59] *Sustaining the Force in the 21st Century: A Functional Concept for Future Installations and Logistics Development* (Washington, DC: Headquarters Marine Corps, 2019), 6.

interoperability arrangements.[60] As an example of these types of efforts, the United States is partnering with Australia and Papua New Guinea to modernize the Lombrum Naval Base in Papua New Guinea. Australia is also spending a total of $29 million on defense projects in Papua New Guinea to counter Chinese efforts to increase and expand its influence.[61] Along with regional allies, the United States must employ economic instruments with greater intensity and frequency by pushing manufacturing of key defense systems to trustworthy and capable allies, like Australia, while investing in infrastructure development to increase local maritime access. Long-range precision weapons technology has made fixed infrastructure more vulnerable, but access to basing rights and use of infrastructure are important components that ensure forces have sufficient sustainment to succeed and are resilient enough to withstand distribution and supply chain disruptions due to weather, enemy action, or poor planning. The port of Rabaul in Papua New Guinea represents a viable cooperative security location and one of many investment options that would strengthen access and improve seabasing and logistics support in the region.

The topics addressed above provide additional research opportunities that would improve on the ideas and concepts expounded on in this chapter. First, it should be determined whether logistical concepts in the maritime domain are being sufficiently challenged and evaluated during the wargaming process. Anecdotally, the warfighting function of logistics and sustainment is paid insufficient attention during wargaming. Realistically evaluating the concept of logistics against enemy actions and the effects of the environment provide vital feedback regarding the supportability of concepts of operation. Feedback on the concept of logistics will generate a sense of urgency to prioritize technological solutions to validated shortfalls. Second, future research should focus on technological solutions to make MPF vessels smaller, more risk worthy, and configured to support distributed operations in accordance with EABO concepts of employment. Last, future research efforts could identify other defense system candidates for overseas manufacturing.

Conclusion

Seabasing remains an enduring and viable concept of employment despite the challenges that advanced weaponry and A2/AD threats pose. However, much needs to be done to ensure that seabasing platforms and maritime logistics concepts of support can withstand the strain and pressure of operating in a distributed EABO environment. To be sure, technological developments would alleviate some of the

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[60] RAdm Frank Morley, USN, and Steve Bowdren, "We Must Win the Competition for Maritime Partners: Partners and Allies Are an Advantage for the United States, but They Also Have Become an Asymmetric Attack Vector for Russia and China," U.S. Naval Institute *Proceedings* 146, no. 3 (March 2020): 26.
[61] Tim Fish, "Australia, U.S. Set to Expand Papua New Guinea Naval Base," *USNI News*, 23 November 2018.

shortfalls in the MPF's ability to operate in a contested maritime domain, but the current constrained fiscal environment likely precludes significant investment in such technology. To improve seabasing, the United States must implement a seabasing strategy that increases the speed and volume of wartime materiel delivered from ship to shore through cooperation with allied and partner navies, improve interoperability with allies and partners through improved training exercises and development of a logistics common operating picture, and integrate economic statecraft to a greater degree to increase access and strengthen infrastructure to support seabasing in the Indo-Pacific region.

Historically, seabasing has reflected America's unwritten strategy of being capable of operating independently of allies.[62] Certainly, allies and partners can be fickle and their participation and cooperation are not guaranteed. In 2003, Turkey initially denied the United States overflight rights as it sought to prosecute combat operations against the Taliban in Afghanistan. While there are risks associated with relying on allies and partners, the next conflict will demand that the United States fight shoulder-to-shoulder with them. It can ill afford to lose access to and the competition for maritime partners in this region. Economic, diplomatic, and military instruments of national power must be integrated to maximize the effects of seabasing. In the end, "the U.S.' network of allies and partners is a strategic center of gravity, and the nation should do everything it can to ensure as many of these navies as possible are capable of integrating with U.S. forces."[63] Expeditionary advanced base operations and the current operating environment require that foreign policy be sent back to the sea.

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[62] Parker, *Seabasing since the Cold War*, 4.
[63] LtCdr Andrew R. Poulin, USN, "The Global Maritime Coalition 2.0," U.S. Naval Institute *Proceedings* 146, no. 3 (March 2020): 22.

Chapter 4

A Case for Mutual Security in the Indo-Pacific

Major Marianne C. Sparklin, USMC

The national security of the United States in the Indo-Pacific region depends on the continued sovereignty and independence of what is known as the first island chain (FIC). In his 2019 planning guidance for the U.S. Marine Corps, Commandant General David H. Berger discussed the requirement to transform the force to meet future requirements in support of national security interests. He writes that Marines "will focus on exploiting positional advantage and defending key maritime terrain that enables persistent sea control and denial operations forward."[1] As General Berger made his call for change, the Marine Corps Warfighting Lab at Marine Corps Base Quantico developed the concept of expeditionary advanced base operations (EABO), meant to establish the use of low-signature, combat credible stand-in forces (SIF) inside of an adversary's antiaccess/area-denial (A2/AD) weapons engagement zone (WEZ). Both the SIF and EABO could satisfy Berger's operational requirements by confronting and countering malign adversary behavior and acting as a deterrent for war in support of the Joint force.[2] However, neither the Commandant's guidance nor EABO address how the SIF can gain access to and exploit persistent forward positions on key terrain during competition and conflict. If the SIF is expected to be credible, positioned, and ready to confront adversaries, the United States must first address how the SIF enters the area.

The United States has a "geostrategic flaw of assumed international acquiescence" in which it believes it will receive access to all domains wherever and whenever it wants in a time of crisis.[3] For a concept like EABO to be successful, however, diplomacy must first enable the United States to obtain active consent and cooperation from sovereign states where the SIF needs to operate. At this time, China is attempting to diminish the sovereignty of the local states within the FIC, which threatens the ability of the United States to defend them. As a result, the United States must create a symbiotic relationship between its national interests and preserving the FIC's sovereignty.

Rather than a bilateral Sino-American dispute, future fights in the Indo-Pacific will consist of local countries, with support from the United States, banding together

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[1] Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019).
[2] Col Art Corbett, USMC (Ret), "Stand-In Forces: Disrupting the Current Struggle for Dominance," *Marine Corps Gazette* 103, no. 2 (February 2019): 27–29; and *A Concept for Stand-in Forces* (Washington, DC: Headquarters Marine Corps, 2021).
[3] Col George J. David, USMC, "Making It Work: *Force Design 2030* and Access," *Marine Corps Gazette* 104, no. 10 (October 2020): 47.

in an existential fight for their sovereignty. Therefore, mutual defense and security among the islands themselves are critical to both preserving their sovereignty and enabling the United States to defend them. A regional defense institution can set the necessary conditions for deterring China in the region.

This chapter provides a geographical and geopolitical context—based on the modern-day application of the geopolitical theories of Sir Halford J. Mackinder and Nicholas J. Spykman—for the current competition between the United States and China as well as the strategic importance of the FIC. It also offers an operational context that describes the requirement for EABO, including the SIF, and the need for mutual defense and security to facilitate these concepts. Within this framework, this chapter examines the theoretical and practical foundations of alliances, providing historical examples of various security architectures and the strategic requirement for such organizations, and lays out recommendations for a modern-day security institution for the Indo-Pacific.

Geographical and Geopolitical Context

Conflict between two great powers that results in a zero-sum outcome—such as the potential one between the United States and the Soviet Union (USSR) during the Cold War—is no longer possible in the twenty-first century. Today, the United States and China are both at the center of vast economic and diplomatic networks. Unlike the USSR, the West invited China to become an integral part of the Western global economy.[4] Currently, China uses its integration into these supply chains and investment in the infrastructure of developing nations to complicate relationships between the United States, its allies and partners, and candidates for a security and defense institution in the Indo-Pacific.[5] Influencing countries within the region that depend on China for economic viability is vital to China's expansive interests, allowing it to leverage its economic power over them.[6] Defending those countries that China would likely exploit is critical to the security of the global commons, open market access, and global economic stability, all central to the national interests of the United States. The countries most at risk of Chinese exploitation are those closest to China's shores, including Japan, South Korea, Taiwan, and the Philippines, among other major nations, and the many contested islands in the South and East China Seas.[7] Known as the first island chain, the loss of their sovereignty to China poses the greatest threat to the national interests of the United States and its allies (figure 19).

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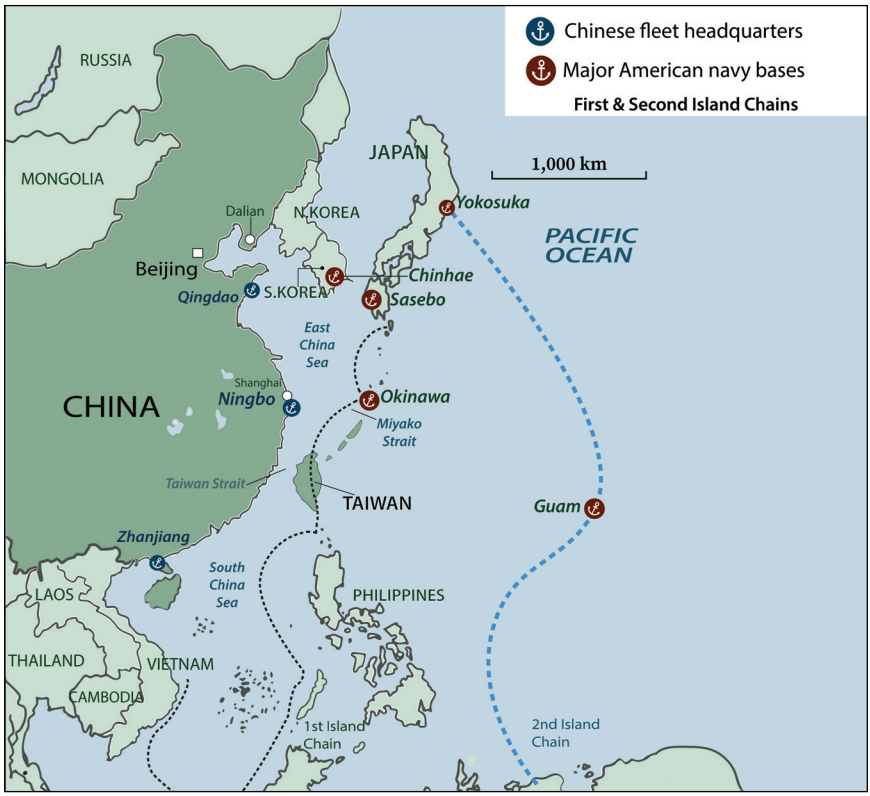
[4] Anne-Louise Antonoff, interview with the author, 15 January 2021, hereafter Antonoff January interview.
[5] *Hearing on China's Expanding Influence in Europe and Eurasia*, 116th Cong. (9 May 2019) (statement of Philippe Le Corre, Nonresident Senior Fellow, Carnegie Endowment for International Peace).
[6] Antonoff January interview.
[7] Richard Caroll, "China Has Almost Breached the First Island Containment Chain," *International Policy Digest*, 17 March 2020.

Figure 19. The first and second island chains



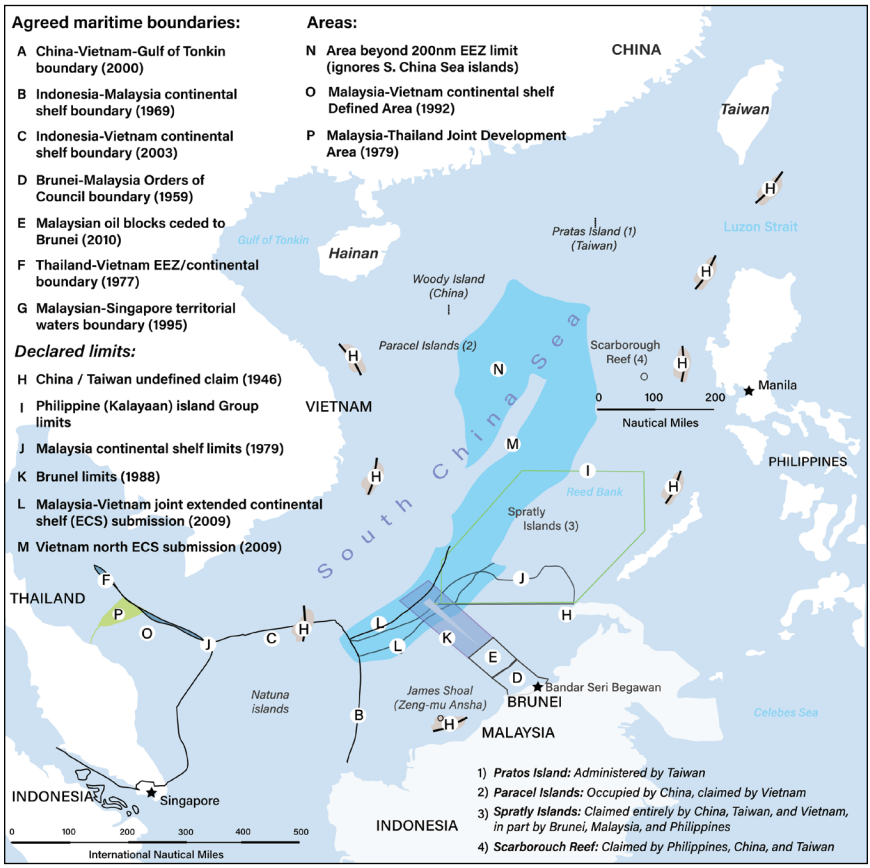
Source: "Indo-Pacific News—Watching the CCP-China Threat," Twitter, 4 May 2020, 7:46 a.m., adapted by MCUP.

In the past 20 years alone, China's military and economic expansion have propelled its influence far beyond the Indo-Pacific region. China's territorial claims within the "nine-dash line" inflame tensions and disturb relationships with the United States and competing claimants in the East and South China Seas (figure 20).[8] Additionally, China has been communicating its intentions to upend the United States-led international world order and replace it with a China-led one since the 1990s.[9] In that time, China has been pursuing its own economic, martial, and political initiatives in support of

[8] The nine-dash line started as a line drawn before the Chinese Civil War by Chinese cartographers around islands in the South China Sea in an attempt to establish claims over them. The PRC still uses this line to claim the islands as part of their territory. This line has caused disputes between China and its neighbors that also make claims over these islands. For more, see Jeffrey A. Bader, "The U.S. and China's Nine-Dash Line: Ending the Ambiguity," Brookings Institute, 6 February 2014.

[9] Aaron Bartnick, *Asia Whole and Free?: Assessing the Viability and Practicality of a Pacific NATO* (Cambridge, MA: Belfer Center for Science and International Affairs, Harvard Kennedy School, 2020).

Figure 20. The nine-dash line and territorial disputes in the South and East China Seas



Source: *Annual Report on China to Congress: Military and Security Developments Involving the People's Republic of China*, 2012 (Washington, DC: Office of the Secretary of Defense, 2012), 37, adapted by MCUP.

"what it views as a natural transition to regional predominance."[10] Accordingly, China views the presence and influence of the United States in the Indo-Pacific as the most significant roadblock to China's rise and sovereignty, specifically related to Taiwan and its territorial claims in the South and East China seas. Furthermore, China continues to threaten global access, denying other countries freedom of navigation and contesting their ability to operate freely in economic and commercial zones.[11] Although China

[10] Anthony H. Cordesman and Max Molot, "The U.S. Department of Defense, Defense Intelligence Agency, and INDOPACOM Command View of China's National Security Strategy," in *China and the U.S.: Cooperation, Competition and/or Conflict* (Washington, DC: Center for Strategic and International Studies, 2019), 49.

[11] *National Security Strategy of the United States of America* (Washington, DC: White House, 2017), 27.

presents itself as a mutually beneficial partner, the risks usually involve diminished sovereignty to its clients around the globe.[12]

China uses gray zone warfare and salami-slicing tactics to improve its position and influence weaker countries, daring more powerful nations to come to the rescue of the small states. *Salami-slicing tactics* refers to the "slow accumulation of small changes, none of which in isolation amounts to a casus belli, but which add up over time to a substantial change in the strategic picture."[13] China also applies economic leverage to make the countries that experience these tactics comply. This strategy puts less powerful countries in a catch-22. If the smaller country turns to the United States, they face potential economic retaliation by China. Conversely, if it succumbs to China's tactics, they risk reduced sovereignty, impacting the region's overall security. Consequently, these countries attempt to center themselves between China and the United States over fears that balancing or bandwagoning with one may end the benefits of the other, but the result of this hedging often swings in China's favor. Combined with the forbearance of the United States concerning salami-slicing tactics, China's strategy continues to prove successful in the region.[14]

Since the implementation of President Barack H. Obama's pivot to the Pacific strategy in 2012, China has increased its expansive efforts in the Indo-Pacific. Numerous examples of these efforts illustrate the potential for new conflicts. For instance, tensions between Vietnam and China have increased due to the establishment of Chinese military and paramilitary garrisons at Sansha City on Woody Island; the Philippines and China have had protracted standoffs over Scarborough Reef; Japan and China have had disputes over Senkaku and Diaoyu Islands; and tensions between India and China have grown over the Line of Actual Control. Because of these examples and countless others, President Donald J. Trump's administration placed more emphasis on China's rise and threat to access in the region. The 2017 *National Security Strategy of the United States of America* acknowledged that these threats undermine regional stability, diminish sovereignty, and endanger the free flow of trade there.[15] These increased risks led the Trump administration to place China in the foreground of foreign policy.

President Joseph R. Biden's administration plans to continue his predecessor's hardline foreign policies on China, which the former recognizes as the most significant competitor, while also maintaining stability and relationships with regional allies and partners that can help the United States rise to that challenge.[16] In their first cabinet-level trip to the Indo-Pacific in March 2021, Secretary of State Antony J.

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[12] *National Security Strategy of the United States of America*, 46.
[13] Robert Haddick, "America Has No Answer to China's Salami-Slicing," *War on the Rocks*, 6 February 2014.
[14] Haddick, "America Has No Answer to China's Salami-Slicing."
[15] *National Security Strategy of the United States of America*, 46.
[16] Yen Nee Lee, "Biden's Team Talks Tough on China as Early Signs Show Policies Won't Differ Sharply from Trump's," CNBC, 22 January 2021.

Blinken and Secretary of Defense Lloyd J. Austin III acknowledged the challenge China presents and affirmed America's commitment to the region. Furthermore, the two cabinet members asserted that cooperation with allies to counter China is the focus of the administration's Indo-Pacific policy.[17] As the Biden administration crafts its policies toward China, American leadership will need to understand China's strategic outlook to create an effective approach to balance or counter it effectively.

According to a 2020 report on China's trends and trajectories, its grand strategy has evolved from rebuilding to rejuvenation since the creation of the People's Republic of China (PRC) in 1949. Throughout this evolution, China has maintained two enduring goals: restoring and maintaining its territorial integrity and preventing domination by another world power.[18] However, there is tension between China's stated goals and how they are filtered through its national security priorities. For example, the PRC increasingly pressures countries to cooperate with it through its economic strength and trade relationships. China's leadership proclaims it wants regional stability, but it is willing to play a destabilizing and threatening role to fulfill its strategic goals of territorial integrity and regional hegemony. Because China's strategic interests directly threaten the sovereignty of the FIC nations, preserving those island countries' sovereignty must be at the heart of U.S. foreign policy.

Since World War II, the United States has aimed to maintain open sea lanes for freedom of navigation, free trade and commerce, and power projection to protect the sovereignty of its allies and partners. By doing this, the United States ensures that no single power can dominate any part of the Indo-Pacific region.[19] Until recently, the United States has successfully achieved these goals. During the past two decades, however, China has challenged the preeminence of the United States, both militarily and economically, and now appears poised to surpass it.[20] China's gray zone tactics, including its build up of military assets and its economic influence over its neighbors, increases the difficultly for the U.S. military to operate in the region through traditional means, such as seabasing and power projection close to enemy shores.[21] Above all, China's A2/AD systems significantly inhibit the United States and its allies from operating inside the WEZ, making a persistent forward presence there an operational requirement to achieve the strategic ends of defending the FIC (figure 21).

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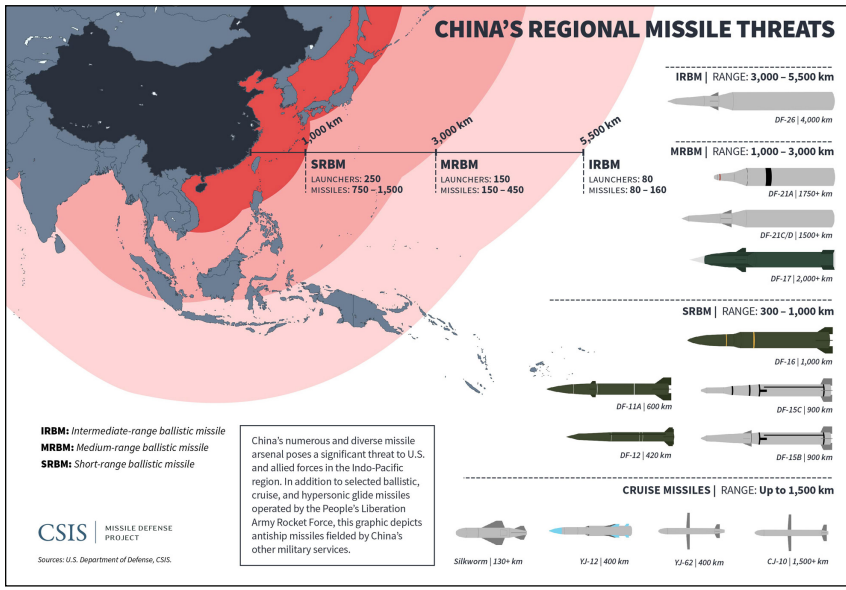
[17] Anthony Kuhn, "In Tokyo, Blinken and Austin Work to Revive Asian Alliance to Counter China," NPR, 16 March 2021.
[18] Andrew Scobell et al., *China's Grand Strategy: Trends, Trajectories, and Long-Term Competition* (Santa Monica, CA: Rand, 2020), 10–11, https://doi.org/10.7249/RR2798.
[19] Michael J. Green, *By More than Providence: Grand Strategy and American Power in the Asia Pacific since 1783* (New York: Columbia University Press, 2017), 1, 5.
[20] Ashley Townshend, Brendan Thomas-Noone, and Matilda Steward, *Averting Crisis: American Strategy, Military Spending and Collective Defence in the Indo-Pacific* (Sydney, Australia: United States Studies Centre, University of Sydney, 2019), 1.
[21] John Garrick and Yan Bennett, "China's Rise and the Weaponization of Soft and Hard Power: How the U.S., Japan, India and Australia Are Responding," *Journal of Political Risk* 8, no. 9 (September 2020).

Figure 21. China's antiaccess/area-denial weapons engagement zone



Source: U.S. Department of Defense, "China's Regional Missile Threats," CSIS Missile Defense Project, May 2020.

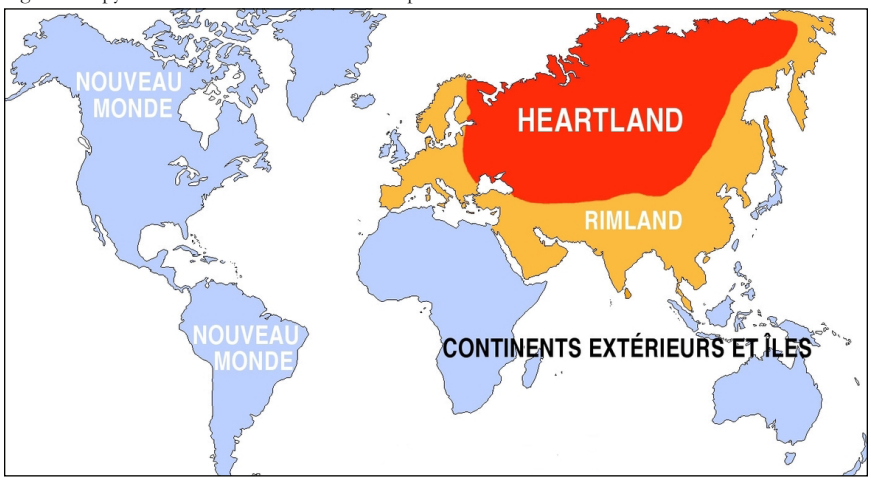
Geopolitical Theory

Geopolitical theories can help conceptualize the problems related to great power competition in the Indo-Pacific. In the early and mid-twentieth century, two theories emerged regarding areas considered the *Heartland* and the *Rimland*, which analyzed the power struggle between a land-based power and a sea-based power (figure 22).

In 1904, British political geographer Halford Mackinder published his seminal article "The Geographical Pivot of History" in which he theorized about the power of the land-based Heartland. According to Mackinder, the Columbian Age was approaching its end and other parts of the world, once in the shadows of British maritime dominance, would soon begin to challenge their power.[22] With the end of this era looming, Mackinder's work was clearly a warning directed at his own country that the balance of power would swing from a sea power to a land power.[23] At the turn of the century, modern technology and industrialization unlocked the potential of long-distance rail transportation. As a result, land powers could quickly move

[22] Halford J. Mackinder, "The Geographical Pivot of History," *Geographical Journal* 23, no. 4 (April 1904): 421–44. Geographer Geoffrey Parker defines the *Columbian Age* as "a period of European expansion and world domination which began in the fifteenth century." Parker, *Geopolitics: Past, Present, and Future* (Washington, DC: Pinter, 1998), 21.
[23] Parker, *Geopolitics*, 105.

Figure 22. Spykman's Heartland and Rimland maps



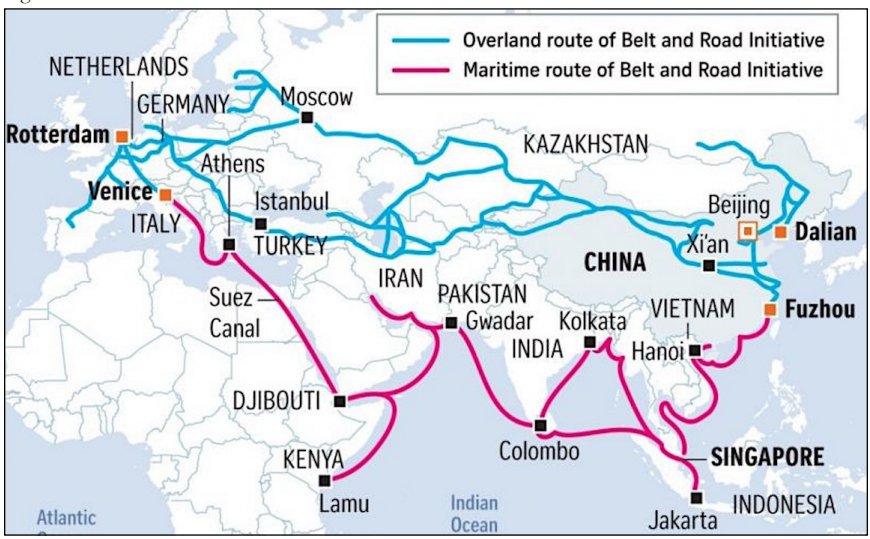
Source: Francis P. Sempa, "The United States, China, and 'The Geography of Peace'," Real Clear Defense, 12 June 2020.

people and resources within the Heartland's large geographic expanse. Additionally, its surrounding geography and terrain helped protect and insulate its society from sea-based competitors like the British Empire. Therefore, Mackinder theorized, the Heartland could "possess the power and geographic centrality to overwhelm the states of the coastal marginal crescent."[24] With the rise of a Heartland power, the inner and outer crescent maritime states would have to constantly remain on guard to fend off continental aggression and expansion.[25]

Building on but contrasting with Mackinder's theory, Nicholas Spykman published *America's Strategy in World Politics* in 1942 and *The Geography of the Peace*, which came out posthumously in 1944.[26] These two works, published during World War II, argued that the real power "lay neither in the maritime nor in the continental worlds but the land in between them."[27] Spykman theorized that the Rimland states—what Mackinder called the inner and outer crescent—had the geopolitical advantage over the Heartland. The superior mobility the sea offered, the capacity for power projection inland, and the access to natural resources and trade would keep the Heartland power

[24] Mackinder, "Geographical Pivot of History"; and Peter Roberts and Sidharth Kaushal, "Mackinder, Spykman and the Geopolitical Significance of Ballistic Missile Defence," *RUSI Newsbrief*, January/February, 2019, 1.
[25] Parker, *Geopolitics*, 103.
[26] Nicholas J. Spykman, *America's Strategy in World Politics: The United States and the Balance of Power* (New York: Harcourt, Brace, 1942); and Nicholas J. Spykman and Helen R. Nicholl, *The Geography of the Peace* (New York: Harcourt, Brace, 1944).
[27] Parker, *Geopolitics*, 124.

Figure 23. China's Belt and Road Initiative



Source: "Indo-Pacific News—Watching the CCP-China Threat," Twitter, 4 May 2020, 7:46 a.m.

and its expansion at bay. Therefore, according to Spykman, whoever controlled the Rimland could control "the destinies of the world."[28]

Today, China employs aspects of both theories. China uses Mackinder's Heartland theory to expand its influence around the globe. China spends trillions of dollars through the Belt and Road Initiative (BRI) to expand rail, highways, ports, and transportation hubs to reroute trade to China (figure 23).[29] It is also extending its reach into the territory of the Rimland states near the East and South China Seas to gain regional hegemony. In both cases, China challenges less powerful nations in exchange for economic assistance and security by building islands and infrastructure, establishing a military presence, and using its navy and maritime militia to expand its maritime control and project power outward. Moreover, expanding their maritime power into the Rimland areas restricts other states from accessing these strategically significant areas, giving China an advantage.

China's A2/AD strategy in the Indo-Pacific simultaneously acts to protect the Heartland while expanding into the Rimland. Taking command of the South China Sea and the island-nations of the FIC could enable China to project its power

[28] Spykman and Nicholl, *Geography of the Peace*.
[29] According to the official commercial website of the BRI, it is a "transcontinental long-term policy and investment program which aims at infrastructure development and acceleration of the economic integration of countries along the route of the historic Silk Road. The initiative was unveiled in 2013 by China's President Xi Jinping and, until 2016, was known as OBOR—One Belt One Road." "Belt and Road Initiative," Beltroad-initiative.com, accessed 22 March 2021.

throughout the Pacific and Indian Oceans, and beyond, through domination of major sea lines of communication and trade. With control over these key locations, China could establish a strategic, global advantage, making the competition between the United States and China one of the United States trying to prevent China from, as Spykman would say, "controlling the destiny of the world." More simply, this great power competition is about competing for the sovereignty of the states within the Indo-Pacific Rimland. As a result, the U.S. military must have a strong strategic emphasis on protecting and defending the FIC states and the access around these geostrategic areas.

The SIF and EABO offer the U.S. military and its allies one option for maintaining a risk to China's Heartland and deterring its expansion efforts. The U.S. military depends on its relationship with allies and partners in the Indo-Pacific to help project its global power and to protect its national interests abroad. If China exploits gaps in bilateral relationships to coerce weaker nations to take the "China option" to dominate the region, the United States could potentially lose its ability to respond to crises there. A concept like EABO would give the United States the geographic and geopolitical advantage to prevent this exploitation from happening by positioning the SIF in geographically advantageous locations within the FIC, preventing China from doing the same. This proactive and preemptive military deterrent depends on the ability of the United States to defend the entirety of the chain rather than taking a piecemeal approach or protecting individual islands. Especially in a conflict against Taiwan, the U.S. response to Chinese aggression will depend on its ability to be physically present across the entire archipelago before any conflict begins to prevent China from out-maneuvering the United States and its allies.

Operational Context

The United States has and continues to exercise its power projection capabilities to deter potential adversaries. Dating back to the Spanish-American War of 1898 and throughout the twentieth and twenty-first centuries, the United States has been a prominent power and has generally kept conflict with other great powers, such as Germany and the USSR, far from the American mainland.[30] Unmatched superiority and supremacy across multiple domains facilitated American freedom of action and maneuver "to the point where the nation came to take it for granted that it would always have 'access,' welcome or not."[31] The return of great power competition in the twenty-first century with "near-peer" and "peer" adversaries and long-range A2/AD systems invalidates these assumptions of guaranteed operational access.

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[30] Gier Lundestad, " 'Empire by Invitation' in the American Century," *Diplomatic History* 23, no. 2 (Spring 1999): 189–90, https://doi.org/10.1111/1467-7709.00163.
[31] Antonoff January interview.

The solution of expeditionary advanced bases and the importance of geography arises from the fact that both fixed and conspicuous infrastructure, such as hardened structures and established runways, and the more expeditionary solution of seabasing is complicated within China's WEZ, due to its robust A2/AD capabilities denying the United States multidomain access close to its shores (figure 24).[32] As a result for the United States, traditional power projection techniques of patrolling large, blue-water navies are becoming increasingly obsolete. EABO provides a suitable and transformative alternative to these conventional power projection methods. This novel operational approach presents the U.S. military, especially SIFs, the ability to "persist forward" with an uninterrupted yet low-signature presence while still maintaining the offensive capability to react quickly to threats, especially those related to Chinese aggression in the region.

The SIF's purpose is to set the necessary conditions to make EABO possible if deterrence fails. To do so, it must be permitted to operate from within the WEZ well before any conflict begins, which requires invitations from the sovereign nations to receive access in the first place and enable the SIF to functionally and seamlessly operate in an EABO-like construct. Additionally, the SIF must be low-signature, highly mobile, and, most important, distributed across the multiple island chains in the Indo-Pacific. In turn, they must also rely on the sovereign host-nation for material support, including supplies, electricity, and water among other logistical requirements, to provide that uninterrupted and low-signature presence. Moreover, the presence of a SIF necessitates these states allow sustained access for, as well as coordinate and prearrange other support capabilities with the U.S. military in exchange for their own defense.[33] This symbiotic relationship will also require interoperability of weapon systems and logistical support along with diplomatic interaction to support the sustained and persistent presence of these forces. Without the cooperation of allies and partners in the region as well as an unified strategy for maintaining the territorial integrity of the island chains, a military concept like EABO—and global security against Chinese aggression as a result—is not feasible.

The Need for Mutual Security

In his work *Archipelagic Defense*, Andrew F. Krepinevich Jr. argues that the capability for a coalition of local countries to "impose a successful blockade" in the region could "increase Beijing's anxiety over its ability to sustain arms production and operations as well as maintain internal stability in the wake of shortages created by a Coalition blockade."[34] If the participating countries could maintain this blockade during a possible conflict, he

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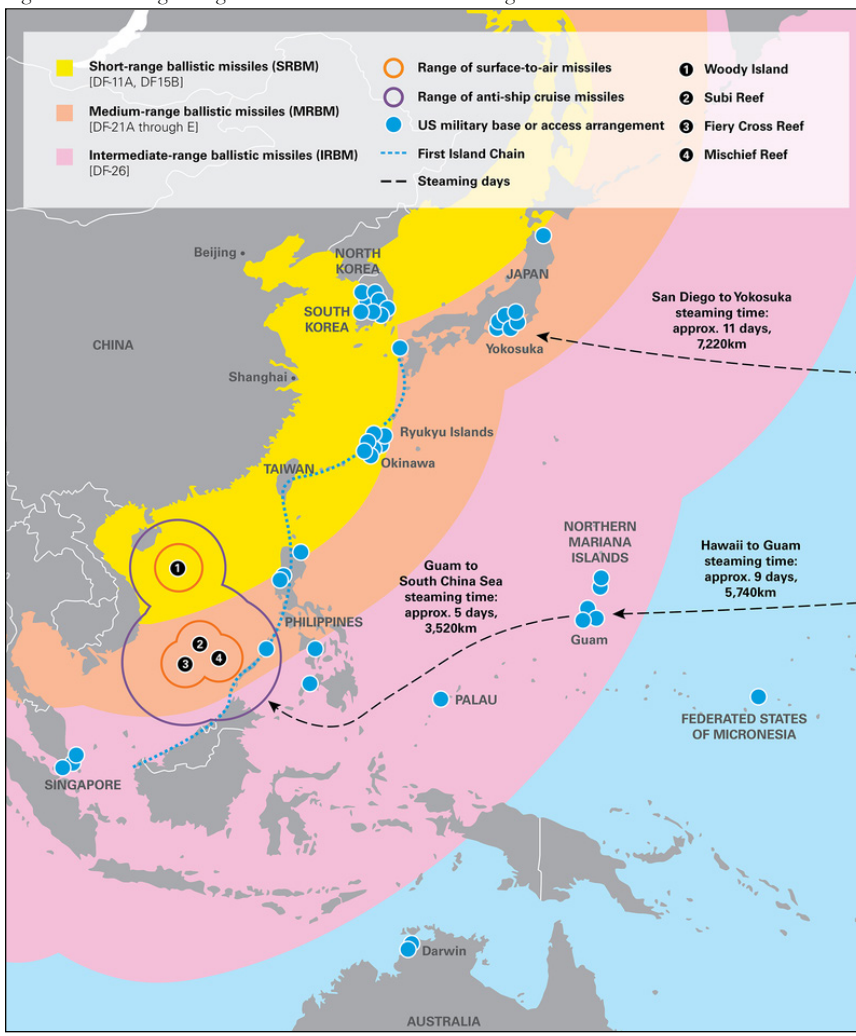
[32] Anne-Louise Antonoff, interview with the author, 11 March 2021, hereafter Antonoff March interview.
[33] Antonoff March interview.
[34] Andrew F. Krepinevich Jr., *Archipelagic Defense: The Japan-U.S. Alliance and Preserving Peace and Stability in the Western Pacific* (Washington, DC: Sasakawa Peace Foundation, 2017), 89.

Figure 24. China's growing missile threat to U.S. bases and regional access locations

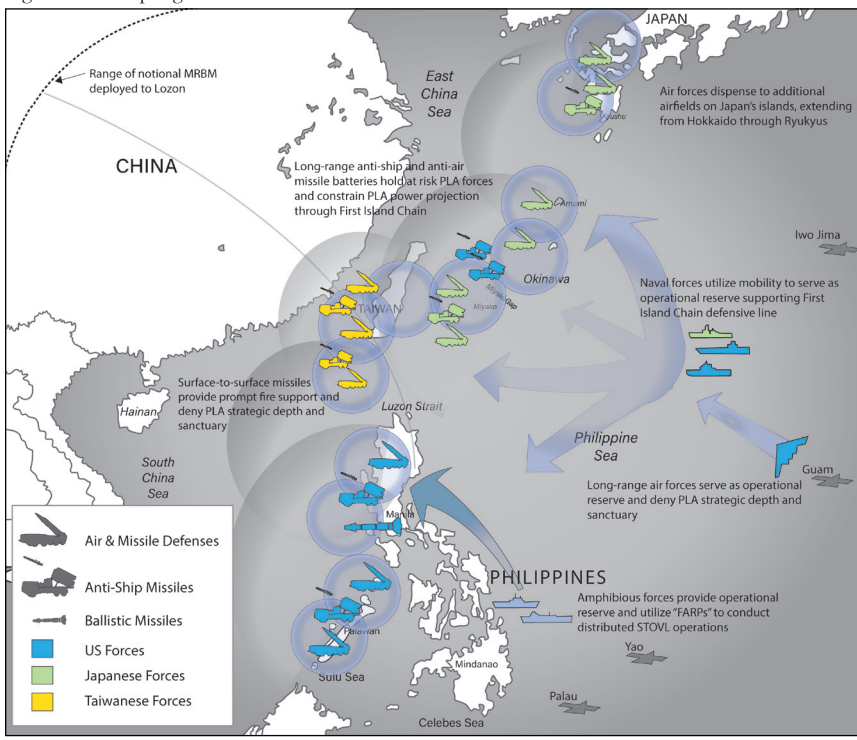


Source: Center for Strategic and International Studies, Heritage Foundation, Office of the Secretary of Defense. Calculations by the United States Studies Centre at the University of Sydney, Australia.

contends, China would risk high attrition rates and cause it to account for a broader range of potential adversaries (figure 25).[35] For a concept like EABO, the FIC must collectively act as this blockade with the SIF as the combat-credible force on the archipelagos that would deny and counter any fait accompli gambits from China. To effectively deter Chi-

[35] Krepinevich, *Archipelagic Defense*, 95.

Figure 25. Archipelagic defense overview



Source: Department of Defense map, adapted by MCUP.

nese expansion, the nations of the FIC would need to defend themselves with the help of the United States and its allies and partners that are willing to cooperate and to contribute resources for establishing a credible and robust defense. This collective defense would also involve a comprehensive effort across the FIC's entirety to ensure sea control and denial to prevent the Chinese from outmaneuvering the SIF and occupying the many chokepoints or narrow seas between neighboring territories.[36]

Without an agreement for mutual defense in the FIC, it may be impossible for the United States to achieve effective EABOs. For this concept, it is essential to have a unified and coordinated response before the outbreak of war rather than an improvisational approach when a conflict begins. A commitment to mutual defense would give the United States and its allies the strategic options necessary to support local fights for sovereignty against China and sets the diplomatic prerequisites for having a SIF that can operate across the entire island chain and set the conditions

[36] Antonoff March interview.

for defense against any Chinese actions. Doing so would help the coalition facilitate its operational and strategic success in a potential conflict with China. With preservation of the FIC nations' sovereignty being the ultimate goal for U.S. strategy against China, a commitment to mutual defense is necessary to ensure its success.

Theoretical Foundations of Alliance Building

When considering mutual security and defense between states, it is important to understand the theoretical foundations for building alliances and the geopolitical considerations for what type to build. In his book *The Origins of Alliances*, Stephen M. Walt argues that countries create alliances to benefit from each other and protect against threats.[37] He challenges the conventional wisdom that these relationships develop in response to a rising power. Instead, he concludes that where "balance of power theory predicts that states will react to imbalances of power, balance of threat theory predicts that when there is an imbalance of threat . . . states will form alliances or increase their internal efforts in order to reduce their vulnerability."[38] He uses the example of how the United States and its allies in both the First and Second World Wars became more powerful than Germany, although Germany was more "threatening" with its aggregate of offensive capabilities, proximity, and aggressiveness that caused an opposing coalition to form.[39] He further determines that balance of threat theory explains that states of equal power will ally with the side that it believes is the least dangerous, as illustrated with nations choosing between the United States and the Soviet Union during the Cold War.

Today, the countries in the Indo-Pacific do not want to be forced to choose between China and the United States. Having to choose between China and the United States could be disastrous for the other Indo-Pacific nations as forcing them to lean one way or the other would wreck their relations with the opposition and potentially drag them into a conflict between the two. The balance of threat theory, however, suggests the regional countries must be willing to band together in a coalition of aggregate capabilities in the name of mutual defense as China continues to assert its malign influence and to balance the growing threat. A mutually supportive relationship that centers on the defense of the countries themselves and not simply on the national interests of the United States would be necessary for the foundations of a mutual defense commitment in the region.

Georgetown University professor Victor D. Cha argues that great powers maximize their strength through a system of alliances where the states are asymmetrically dependent on the hegemon based on an examination of the networks of bilateral alliances formed in Asia in the 1950s. During that decade, the United States created

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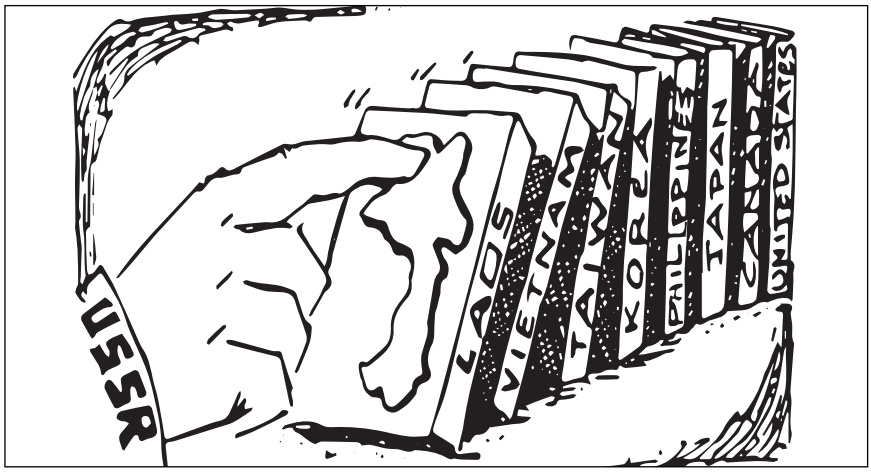
[37] Stephen M. Walt, *The Origins of Alliances* (Ithaca, NY: Cornell University Press, 1990), vi.
[38] Walt, *Origins of Alliances*, 263.
[39] Walt, *Origins of Alliances*, 264.

Figure 26. A political cartoon of the "Domino Theory" in the Cold War



Source: "Domino Theory," Political Dictionary, accessed 25 May 2022.

a hub and spoke alliance system in Asia—what Cha calls an "informal empire," in which the United States exerted power over smaller states in the region.[40] In Cold War Asia, according to Cha, this arrangement was a critical power play to control the U.S. allies, especially those considered "rogue allies" and directly responded to the domino theory that if one country fell to Communism, the rest could follow suit (figure 26). Consequently, U.S. presidents Harry S. Truman and Dwight D. Eisenhower calculated that the benefits of a power play in direct bilateral alliances far outweighed the risk of a multilateral security construct. Cha illustrates that a state generally develops a preference for a multilateral versus bilateral security structure based on their position within a power relationship. Because a bilateral structure offers more control, more powerful nations will choose that system while less powerful nations will choose multilateralism.[41] In the case of the United States in post–World War II Asia, bilateralism gave it the most control over its allies to prevent the spread of Communism as well as over any rogue allies that could potentially drag the United States into an unnecessary war.

In the modern-day Indo-Pacific, the United States no longer sees the need to exert a power play, reflecting a change in its thinking since the mid-twentieth century. Immediately after World War II, American policymakers considered its Asian allies inferior and distrustful, creating a fear of the potential for rogue allies. This concept led them to believe that these partners required tighter control by the United States.

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[40] Victor D. Cha, "Informal Empire: The Origins of the U.S.-ROK Alliance and the 1953 Mutual Defense Treaty Negotiations," *Korean Studies* 41 (January 2017): 222–23, https://doi.org/10.1353/ks.2017.0025.
[41] Victor D. Cha, "Powerplay: Origins of the U.S. Alliance System in Asia," *International Security* 34, no. 3 (Winter 2009/2010): 158–60, 194, https://doi.org/10.1162/isec.2010.34.3.158.

Few of these fallacies in logic exist today.[42] Although the unipolar margin of the United States may be decreasing in the region, the propensity and requirement for multilateral institutions there are not. The Indo-Pacific nations can band together to execute their own power play against China through mutual defense and balancing its influence, preventing individual countries from falling like dominos into China's control. This potential commitment to mutual defense between the FIC countries allows the United States and its extra-regional allies to support their efforts across the chain. It could also provide the foundations for the regional allies to decide how the United States can best support their defense and security with the SIF. The power play for the local countries rests in their ability to confront the China threat and decide that mutual defense is critical to their survival.

Historical Examples

Today's Indo-Pacific nations can turn to historical analogies for models of alliance structures and security institutions that both failed and succeeded. The Delian League, NATO, and the Southeast Asia Treaty Organization (SEATO) provide examples of what could work, what may not work, and what to consider when envisioning a modern-day security architecture for the region.

Formed in 478 BCE, the Delian League was a predominantly maritime organization of Greek city-states along the Aegean Sea that formed in opposition to the expanding Persian Empire. The Delian League offered Ionian cities—Greek settlements along the coasts of the Aegean Sea, including in modern-day Turkey—mutual protection because they were concerned about Persia picking them off one at a time. Headed by the naval power Athens, the league consisted of more than 200 Greek poleis (figure 27).[43] Driven by collective honor, fear, and self-interest, the alliance's primary goals were to prepare for an invasion, seek revenge and reparations against Persia, and guarantee the poleis' continued freedom.[44]

Members of the Delian League received multiple benefits from their association. League members collectively determined its policies and actions during *synods* (meetings).[45] Additionally, the central location of a treasury in Athens allowed for access to funds to support the alliance economically and militarily for the city's security and

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[42] Christopher Hemmer and Peter J. Katzenstein. "Why Is There No NATO in Asia?: Collective Identity, Regionalism, and the Origins of Multilateralism," *International Organization* 56, no. 3 (Summer 2002): 575–607.

[43] Ioannis Georganas, "Delian League," in *Encyclopedia of World Trade: From Ancient Times to the Present*, ed. Cynthia Clark Northrup (London and New York: Routledge, 2004), 266–67.

[44] Thucydides, *History of the Peloponnesian War Books I and II*, vol. 1, *Thucydides*, trans. Charles Foster Smith (Cambridge, MA: Harvard University Press, 1951–53), 129; Georganas, "Delian League," 266–67; and Christopher Planeaux, "The Delian League: Revenge and Hellenic Liberation," Brewminate.com, 6 May 2019.

[45] Planeaux, "The Delian League."

Figure 27. The Delian League

Source: "Delian League," World History Encyclopedia, 4 March 2016.

financing for military operations during the Peloponnesian War (431–404 BCE).[46] Most significantly, the newly formed alliance held three significant advantages over its predecessors in that it allowed members to retain their autonomy within an organized system, they pledged defensive support for each other, and it could "act swiftly and decisively with considerable resources."[47]

Over time, however, the league evolved into the imperialistic Athenian Empire, which required smaller member poleis to become Athenian naval bases. Furthermore, Athens became more concerned with "fostering [their] power and glory" rather than "defending the Greeks against external aggression."[48] Internal strife, disobedience, and rebellious discontent of member states contributed to the alliance's evolution and Athens growth as the dominant power. Although the Peloponnesian War eventually destroyed the Delian League with Sparta's victory over Athens, the league was the first successful large-scale defensive and economic alliance that unified strong and weak en-

[46] Planeaux, "The Delian League"; and Adalberto Giovannini, "The Parthenon, the Treasury of Athena and the Tribute of the Allies," in *The Athenian Empire*, ed. Polly Low (Edinburgh, Scotland: Edinburgh University Press, 2008), 165.
[47] Planeaux, "The Delian League."
[48] Polly Low, "General Introduction," in *The Athenian Empire*, 3.

tities in a cooperative system within Greece to guard against Persia. The Delian League existed more than two millennia ago, but it highlights how smaller island-nations under threat from a dominant land power—Persia, in this case—responded to that aggression. Thucydides postulated that rising power of Athens inevitably caused conflict with Sparta, leading to the outbreak of the Peloponnesian War in 431 BCE, in what today would be known as the "Thucydides Trap."[49]

Global politics now reflect a similar scenario as what occurred 2,400 years ago. Today, local states face an important geopolitical problem in the Indo-Pacific as they navigate the increasingly competitive landscape between the diplomatic, economic, and military options that the United States and China offer. It is in the best interests of the United States and its allies to provide FIC countries better options for ensuring economic and military stability in the face of potential hostilities with China. To escape the Thucydides Trap while preventing China's expansion, the United States and its allies will need to present a credible deterrence within the FIC, starting with a mutual defense commitment to create a Delian League-style association in the Indo-Pacific. This type of organization in the region, centered on the defense of the FIC and including access to a treasury in the form of resources, troops, and support from the United States and its allies, would give the FIC nations defense credibility in the face of China. In the twenty-first century, a regional-centric association provides a synod from which the states themselves can discuss—virtually or otherwise—what is necessary for their defense and how to deter conflict.

Similar to the Delian League and consistent with Mackinder's Heartland theory, NATO was created primarily in response to the rising threat of the Soviet Union, but, unlike the Delian League, it faced numerous challenges to its creation. Initially, as Gary J. Schmitt, a senior fellow at the American Enterprise Institute in Washington, DC, noted, the United States had to overcome its "quasi-isolationist tendencies" and the capitals of Western Europe had to "set aside long-standing, often bitter enmities among themselves" to make the organization work.[50] Overcoming these challenges proved difficult, but the organization eventually provided more than collective defense. Over time, NATO became part of a larger strategic vision that emphasized "economic prosperity, security, and liberal governance as essential to preserving and growing a nascent Western community."[51] By following it, the alliance "proved instrumental in encouraging states and peoples to put aside traditional rivalries in the name of greater regional cooperation."[52] This collaboration prevented the revival of militarism on the European continent while also creating

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[49] Graham T. Allison, *Destined for War: Can America and China Escape Thucydides's Trap?* (Boston, MA: Houghton Mifflin Harcourt, 2017).
[50] Gary J. Schmitt, *NATO's Unsung Virtues* (Washington, DC: American Enterprise Institute, 2018), 2–3.
[51] Schmitt, *NATO's Unsung Virtues*, 2.
[52] Schmitt, *NATO's Unsung Virtues*, 5.

a structure for political integration and international security.[53] Most importantly, Article 5 of the treaty offered member countries the benefit of collective defense.[54]

When the Cold War ended, NATO's fate was uncertain. Germany's reunification under the umbrella of NATO, however, allowed the organization to shift focus from collective defense to building a security architecture, concentrating on both diplomatic and military functions. Like the Delian League, member states within NATO retained their sovereignty, acted on consensus, and operated collectively in defense of other member states.[55] Unlike the Delian League, NATO survived possibly because the sovereignty of the states within Europe, being directly adjacent to the threat of the Soviet Union, remained at the center of the organization's defense commitments.

On the other side of the world, the United States also created SEATO in 1954 to prevent the expansion of Communism in Southeast Asia without violating the Geneva Accords.[56] Secretary of State John Foster Dulles convened eight nations—Australia, New Zealand, Pakistan, the Philippines, Thailand, France, the United Kingdom, and the United States—to sign the treaty despite most of them being located outside of the region (figure 28).[57] Additionally, SEATO lacked standing forces, command posts, and the same mutual defense protections NATO pledged for its members. Instead, SEATO only provided for consultation, meaning that its members were never required to intervene militarily in defense of other members as the Vietnam War highlighted. During that conflict, member nations began pulling away from the treaty due to a lack of support for the war. By 1977, SEATO finally succumbed to a general dearth of enthusiasm—especially from the United States, a lack of mutual defense commitments or unified military command, and competing national foreign policies in the region.

Scholars Christopher Hemmer and Peter J. Katzenstein compare the origins of NATO and SEATO as well as the differences between the two regions at those times. They reason that perceptions of collective identity and racial, historical, and cultural factors shaped the choices of American decision makers after World War II. Based on these elements, the United States saw its European allies as equals while seeing its

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[53] "A Short History of NATO," North Atlantic Treaty Organization, 12 April 2012.

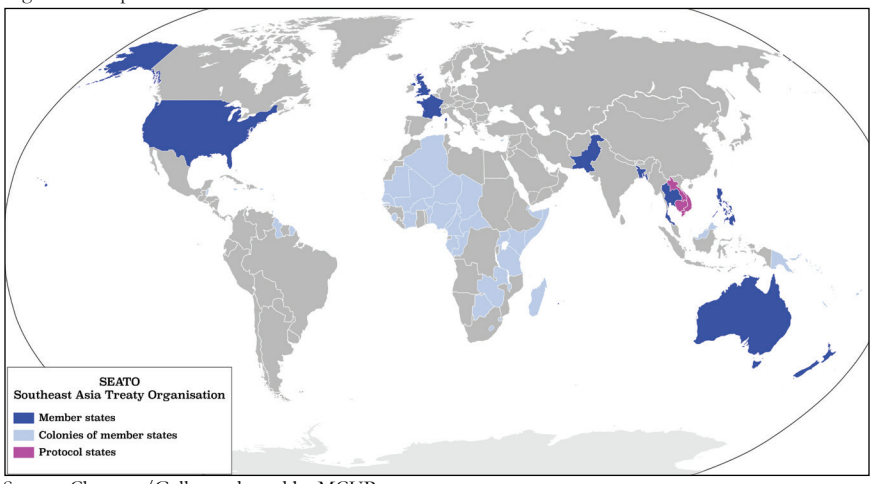
[54] Article 5 of the Washington Treaty, also known as the North Atlantic Treaty, states, "The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that . . . each of them, in exercise of the right of individual or collective self-defense recognized by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area." The Washington Treaty, NATO, 4 April 1949, 34 U.N.T.S 243.

[55] "What Is NATO?," North Atlantic Treaty Organization, 24 May 2017.

[56] "Southeast Asia Treaty Organization (SEATO), 1954," Office of the Historian, Department of State, accessed 15 March 2021. According to this office, "The terms of the Geneva Agreements of 1954 signed after the fall of French Indochina prevented Vietnam, Cambodia, and Laos from joining any international military alliance, though these countries were ultimately included in the area protected under SEATO and granted 'observers' status."

[57] Bartnick, *Asia Whole and Free?*, 8.

Figure 28. Map of SEATO members



Source: Chumwa/Gallery, adapted by MCUP.

Asian allies as "part of an alien and inferior community."[58] Consequently, the collective identity between the United States and European nations made it much easier for multilateralism to endure in the North Atlantic, whereas the United States preferred bilateral approaches to cooperation in Asia. These geopolitical and cultural fissures combined with the lack of a mutual defense commitment inside SEATO ultimately led to this organization's demise.

As the Indo-Pacific looks toward a modern-day security architecture, SEATO provides an important lesson. This failed alliance highlights that "a military alliance is only as strong as its partners' intent and capability to meet its commitments."[59] Specifically, SEATO disbanded when its founding member, the United States, lost the political will to uphold the treaty after the Vietnam War. NATO, however, illustrates that a mutual defense organization can be successful in the Indo-Pacific if the countries themselves cooperate multilaterally for the sake of their own interests rather than those of the United States alone.

Strategic Requirement

The global threat that China potentially poses combined with the complicated geopolitical landscape of the Indo-Pacific presents unforeseen challenges that require creative and innovative military solutions. Regardless of China's rise in the international arena, it may never achieve parity with the United States due to the strategic

[58] Hemmer and Katzenstein, "Why Is There No NATO in Asia?," 575.
[59] Bartnick, *Asia Whole and Free?*, 13.

advantage that the latter holds through its network of global alliances. Still, the United States must strengthen this global complex to preserve the rules-based international system created since World War II. Most importantly, the regional states, especially those within the FIC, must be resilient for their own sake, for their neighbors' sake, and the sake of the region's security to maintain their sovereignty.

As the Delian League, NATO, and SEATO demonstrate, common fear and security interests can spark an alliance's creation, but, according to U.S. Indo-Pacific Command (USINDOPACOM) commander Admiral Philip S. Davidson, coalitions are about trust and mutual understanding. He further states that these types of partnerships "provide the building blocks for a security architecture that promotes interconnectivity and interoperability."[60] Leaders in USINDOPACOM have specifically explored the importance of enhancing the current network of alliances to address China's rise and promote interoperability in the region. Detailing strategic imperatives for the United States in the region, an USINDOPACOM report annotates "Promotion of a Networked Region" as one of its three primary lines of effort. In this report, Department of Defense leadership recognizes the value that alliances play in cultivating security relationships to maintain peace, prosperity, and stability. Additionally, they find that these associations facilitate government and military interactions, promoting interoperability, access, and coordination—the lynchpin to success for concepts like EABO.[61]

A security architecture in the Indo-Pacific that promotes mutual defense would also serve to increase interoperability in command and control; weaponry; and tactics, techniques, and procedures. If a future conflict with China commenced, it would already be too late to solve the problem of interoperability. Any resolutions to related issues must be in place to ensure allies can work together, minimizing the diplomatic and military hurdles that could be catastrophic to acting "swiftly and decisively with considerable resources."[62] A conflict with China will most likely involve numerous countries, requiring them to train together; consolidate their resources; and interoperate with a common purpose and vision in peacetime, competition, and conflict.

The Biden administration also addressed the importance of alliances and partnerships in competition and conflict against potential threats like China. Specifically, its published guidance mentions "reinvigorating and modernizing" U.S. alliances to protect national interests and to "hold countries like China to account."[63] The Biden administration manifests the belief in partnerships and alliances as a critical element

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[60] Adm Phil Davidson, "Addressing the Complexity, Contradictions, and Conundrums of the U.S.-China Relationship" (speech, National Committee on U.S.-China Relations, New York, 9 October 2019).
[61] SecDef Patrick M. Shanahan, "Message from the Secretary of Defense," in *The Department of Defense Indo-Pacific Strategy Report: Preparedness, Partnerships, and Promoting a Networked Region* (Washington, DC: Department of Defense, 2019).
[62] Planeaux, "The Delian League."
[63] *Interim National Security Strategic Guidance* (Washington, DC: White House, 2021), 10.

in preserving and advancing national security interests abroad. Thus, the challenge for the United States military strategies in the future is how to best support Indo-Pacific countries' desires for regional defense against China with the SIF.

When he was Chairman of the Joint Chiefs of Staff, Marine Corps general Joseph F. Dunford Jr. emphasized that allies and partners are the "strategic center of gravity" for the United States and that these networks are central to maintaining its competitive advantage.[64] He also recognized that these relationships enable access and an extended reach, giving the U.S. military the flexibility to project power around the world. These enduring alliances and partnerships, Dunford notes, provide the major benefits of integrated command and control, information and intelligence sharing, and technological interoperability, all critical capabilities for SIFs to operate fully in an EABO construct within the FIC.[65]

The sovereignty of FIC nations must be at the heart of the U.S. military's operational concepts. It is much better to preserve a nation's sovereignty than to take it back from a hegemonic power, such as China. An option to maintain the FIC's sovereignty and prevent a fait accompli is for the local Indo-Pacific states to band together in mutual defense with support from the United States and its allies. Their sovereignty and that of their neighbors must dominate the narrative for the creation of a mutual defense organization in the region.

Considerations

The hub-and-spoke system of bilateral arrangements that developed after World War II is no longer adequate because it does not permit the interoperability and information sharing necessary for potential modern-day conflicts. In the early 1950s, alliances between the United States and Asian countries were not linked to a more extensive multilateral partnership due to a lack of a common enemy as well as the presence of rampant authoritarianism and regional rivalries. In the Indo-Pacific today, "little of this alliance logic remains true."[66] Shared ideologies, identities, democratic values, and security and defense goals along with political, military, and economic modernization are all conducive to mutual defense networking in the Indo-Pacific today. Promoting a regional defense institution there is essential to ensuring the United States and its allies are in position within China's WEZ and interconnected before the onset of a potential conflict. Additionally, multilateral cooperation is vital to integrated operations, which allows forces from multiple countries to converge on any flashpoint without improvising in the moment.

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[64] Gen Joseph F. Dunford Jr., "Allies and Partners Are Our Strategic Center of Gravity," *Joint Force Quarterly* 87 (4th Quarter 2017): 4.
[65] Dunford, "Allies and Partners Are Our Strategic Center of Gravity," 4–5.
[66] Richard Fontaine et al., *Networking Asian Security: An Integrated Approach to Order in the Pacific* (Washington, DC: Center for a New American Security, 2017), 6.

Unlike when the hub and spoke alliance system was created during the Cold War, the Indo-Pacific states are all deeply embedded in the international economy and with each other. The common threat of China also unites them in a shared vision for regional security. These conditions alone could enable the development of a regional security institution if the countries understand the risks of not committing to the mutual defense, mainly that individual states may lose their ability to resist China's strong-arming and regional dominance. Although the United States does not want to push the regional states to choose, China's action may eventually force them to decide.

Some experts may argue that creating an Indo-Pacific alliance similar to NATO would push China into an unwanted conflict. With most countries being economically connected to China, international trade, revenues, and imports/exports may suffer the most. According to former Secretary of Defense Ashton B. Carter, "There is little doubt that a multilateral, U.S.-led security alliance in the Pacific—particularly one involving Taiwan—would draw swift Chinese condemnation and a whole-of-government response."[67] A mutual defense commitment must be looked at through the lens of the countries that depend economically on China. Most countries, including the United States, have some level of economic dependence on China, meaning the risks must be weighed between bandwagoning with a country or continuing to hedge in order to keep the status quo. However, China does find "collective action" to be daunting, making multilateral organizations the best option to deter it.[68] As the Delian League and NATO illustrate, the collective actions of multiple states against a single threat can have demonstrable effects on deterring a threatening entity.

Numerous factors require consideration when discussing a multilateral security architecture in the Indo-Pacific, especially ones that make the concept of collective defense troublesome. An historical dispute between Japan and South Korea about war reparations, territorial disputes in the East and South China Seas, and previous intercountry rivalries all contribute to the complexities associated with creating a formalized security architecture rooted in mutual defense.[69] With time, diplomacy, and rigorous negotiations, however, member countries could build a multilateral approach to mutual defense that accommodates all of their interests. Mainly, the United States must understand the FIC's needs and promote a strategy that both works for the United States and the FIC countries.

Weaving China into the international community is an option to accommodate any country that is reluctant to choose between the United States and China. Carter recommends forming a "principled, inclusive network" that is "driven by shared

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[67] Bartnick, *Asia Whole and Free?*, 13.
[68] Edward Lucas, "Time to Wake Up: The Answer to China's Clear and Ever-Present Threat Is Greater Solidarity," Center for European Policy Analysis, 27 April 2020.
[69] Bartnick, *Asia Whole and Free?*, 36–37, 42–43.

principles like peaceful conflict resolution, freedom of commerce, and shared security responsibilities."[70] This inclusive network would be open to China to participate but the United States must enforce a strict code of conduct for its participation, so it can earn the trust of other member states. Such an organization can accommodate a wide variety of international and domestic national security interests while enhancing a shared vision of regional stability. Instead of containing China's rise, an inclusive system that gives China "greater incentives for integration than for opposition and [increase] the chances that the system will survive even after U.S. relative power has declined" is an option.[71]

China's inclusivity in international institutions facilitates engagement, negotiations, and restraint. The United States must lead countries in the Indo-Pacific toward "more security and economic relations [that] are multilateral and all-encompassing" to ensure that "the global system retains its coherence."[72] Although the United States cannot stand alone against China, the United States with the backing of the Western order can.

A Security Architecture for the Twenty-first Century

A twenty-first century approach to Indo-Pacific multilateralism, rather than establishing a NATO-style institution, should focus on forming a regional security architecture with similar capabilities. There is no proven single model for a mutual defense commitment between states. Yet, in the face of global threats like China's expansion, collectively responding to it is becoming more of a requirement and less of an option. Like other defense commitments, a mutual defense system for the Indo-Pacific would be an agreement between the states that is "subject to binding international norms such as the ban on international aggression" and affords the states "the freedom to shape it according to their interests."[73] Establishing such a security architecture would require a whole-of-government approach from participating countries and shared strategic visions for deterring threats while being adaptable and flexible in both security and defense, promoting interoperability and collaboration, and, most importantly, centering on the interests of the island-nations. The security architecture suggested here may not bind the leadership of local countries to act, but it gives them the ability to do so at a moment's notice allowing the island chains to defend themselves and each other from Chinese aggression.

For this type of institution to work properly, the United States, non–Indo-Pacific allies, and the nations within the FIC would need to commit to a whole-of-government approach. Doing so would bring in all of a government's resources and make them available across

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[70] Bartnick, *Asia Whole and Free?*, 49.
[71] G. John Ikenberry, "The Rise of China and the Future of the West," *Foreign Affairs* 87, no. 1 (January/February 2008).
[72] Ikenberry, "The Rise of China and the Future of the West."
[73] Liron Libman, "A Mutual Defense Treaty with the United States—A Complicated Proposition for Israel," *Lawfare* (blog), 11 October 2019.

allies and partners within the FIC. Multilateral coordination at the strategic level would enable success at the operational level through interoperability, information-sharing, and cooperative training. Without multinational coordination across the FIC, the distributed forces—the SIF—may be vulnerable to out-maneuvering from neighboring islands or littoral regions. For EABO to succeed, the SIF must receive access from the governments first, and coordination must exist with the entire island chain, not just one island.

A commitment to mutual defense in the Indo-Pacific deters the threat from China and protects individual nations' sovereignty, ensuring the Indo-Pacific does not split into separate democratic and Communist spheres. By consolidating intelligence and information-sharing capabilities of the allies, joint attributions could be made against China. Defense does not have to be military alone. Economic security could address the coercive techniques levied against allies, prompting a collective response from the United States and its partners. Solidarity is the best deterrent to China from threatening the sovereignty of Indo-Pacific states.[74]

Although NATO emerged from a threat similar to the one the Indo-Pacific region faces today, a mutual defense organization in the Indo-Pacific would not be a mirror image of it. Diverse political systems, the tyranny of distance, and cultural differences compared to the geopolitical landscape of NATO at its creation prevents it from being a direct model. An Indo-Pacific version would maintain some similarities, however. China represents a common enemy like the Soviet Union did in post–World War II Europe, but is neither vying for world domination nor trying to overthrow governments in the hopes that they too become Communist. Unlike the Soviet Union in the Cold War, China is deeply intertwined with global markets and organizations and the world economy. An Indo-Pacific defense organization would represent a community effort to deter China instead of destroying it. The collective power of a more extensive network of allies there is vital to deterrence in the FIC. A shared vision would set the diplomatic preconditions for enabling a SIF to operate within the region. Additionally, this formalized multilateral institution would serve as a venue for discussing shared visions, regional economic and information strategies, and military interoperability. The supranational organization would promote developing partner capacity, relationship building, and training exercises between different countries to build confidence and morale.

Similar to NATO, an Indo-Pacific security institution would require adaptability and flexibility in response to varying levels of threats and crises. In her report, Celeste A. Wallander, former special assistant to the president for national security affairs and senior director for Russia and Central Asia on the National Security Council staff, notes that the adaptable capabilities of NATO play a crucial role in forward-basing

[74] Anders Fogh Rasmussen, "On Alliance Solidarity in the 21st Century" (speech, Informal Meeting of NATO Foreign Ministers, Tallinn, Estonia, 22 April 2010).

for "logistics, air defense and control, and reinforcement . . . and a common infrastructure program [that] enables members' militaries to work together as complex and multipurpose organizations, not merely as military instruments to blunt attack."[75] She further observes that interoperability, integrated command and control, Joint exercises, institutional transparency, information sharing, and general organizational capability are benefits of this type of security architecture. The United States must gain the strategic initiative through forward deployment and forward-basing of forces to "defend quickly" with a "full-scale effort" if an enemy attacked.[76] A security architecture that enables the SIF to deploy swiftly is critical to executing EABO from the onset of a crisis. Although treaties and alliances do not always guarantee access, diplomacy provides the structure from which operational capability will arise.[77]

Regardless of the political practicality or feasibility of a multinational organization in the Indo-Pacific, the United States and local nations must make proactive steps toward Joint commitments that foster unity in the face of China and enable interoperability in the event of a conflict. Developing these networks with the help of intergovernmental agencies, such as the Department of State, and existing multilateral groupings would be practical intermediate steps that promotes security and defense in the region while enabling operational access. Examples of these Joint commitments include access or overflight diplomatic agreements; information and intelligence sharing agreements; Joint freedom of navigation exercises in commercial, international, and contested waters; and collective economic pledges. Former National Security Advisor H. R. McMaster suggests that the United States "create an international agreement where like-minded countries agree that they will only invest in China and they will only allow Chinese investment in countries if those investments [meet] an economic Hippocratic Oath: Do no harm."[78] Such economic agreements would buy time for an institutionalized security architecture while achieving deterrent effects in the short term.

These Joint agreements must be continually revisited and updated. There is no guarantee for access or overflight rights in peace or conflict but negotiating those rights upfront can save time and hassle when its needed. In the long term, a formalized security architecture can set the foundation for persistent or guaranteed overflight and access rights. Until then, a coalition of democracies must work collectively to protect the sovereignty of smaller countries while preparing for the worst-case scenario with China.

One way the United States could support the creation of a regional security organization is to lead the Indo-Pacific through a process of security collaboration without imposing its national interests. After 1945, the United States found itself

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[75] Celeste A. Wallander, "Institutional Assets and Adaptability: NATO After the Cold War," *International Organization* 54, no. 4 (Autumn 2000): 711, https://doi.org/10.1162/002081800551343.
[76] Wallander, "Institutional Assets and Adaptability," 731.
[77] Antonoff January interview.
[78] David A. Wemer, "H. R. McMaster to Biden: Don't Let Up on Competition with China," Atlantic Council, 24 November 2020.

in an "empire by invitation" where it was frequently "invited" to play a significant role in global leadership.[79] This invitation partly came from the United States being perceived as different from traditional superpowers who wanted to conquer. Instead, the United States ruled "in more indirect, more American ways, so indirect that frequently it is still invited to play the preeminent role."[80] In the Indo-Pacific today, there is still an invitation for American power indirectly that can uplift and support the local states without being labeled as something resembling an American empire. Brokering statecraft between the countries themselves without imposing imperialistic solutions could achieve these goals for the United States. Like Athens in the Delian League, a country that is too imperialistic may become less concerned about defense and more on expansion. The United States must communicate that mutual defense of the region is at the heart of any proposed security architecture.

Finally, another option to increase defense and security cooperation without formally naming a security institution is to enhance the capabilities of the Quad alliance—currently made up of the United States, Australia, India, and Japan—by making this organization a more robust forum for foreign policy and military coordination. In March 2021, Quad leadership released a Joint statement reaffirming their commitment to cooperation and uniting in a shared strategic vision for the region's future.[81] In a speech to the Marine Corps Command and Staff College, General Dunford acknowledged that there is new momentum given to the Quad in the past year and that its structure can be leveraged to respond to China in more than simply military approaches. He further noted that the Quad allows participating countries to develop and test and train integrative strategies that focus on regional security, defense, and interoperability in the Indo-Pacific.[82] To improve, the Quad could include more countries for exercises and coordination in interoperability and communications without the formality of an official alliance. Augmenting the Quad with as many partners as possible is particularly attractive because interoperability built during peacetime and training operations do not have to be improvised during times of conflict.

Conclusion

General David H. Berger points out in his planning guidance that U.S. ambitions must be "more aggressive than preserving status quo options," adding that "while others

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[79] Lundestad, " 'Empire by Invitation' in the American Century."
[80] Lundestad, " 'Empire by Invitation' in the American Century," 217.
[81] "Quad Leaders' Joint Statement: 'The Spirit of the Quad'," press release, White House, 12 March 2021. Initially created in 2004 to assist with humanitarian disasters, the Quad met formally once more until Australia withdrew from the nascent group in 2007. The Quad was revived in 2017 at the East Asia Summit in response to "tectonic shifts in the geopolitics of the region and in the Asia policies of the members of the original Quad." Jesse Barker Gale and Andrew Shearer, *The Quadrilateral Security Dialogue and the Maritime Silk Road Initiative* (Washington, DC: Center for Strategic and International Studies, 2018), 2.
[82] Joseph Dunford, "Command and Staff Centennial" (speech, Marine Corps University, Quantico, VA, 23 March 2021).

may wait for a clearer picture of the future operating environment, [the Marine Corps] will focus efforts on driving change and influencing future operating environment outcomes."[83] The status-quo security architecture and traditional power projection activities in the Indo-Pacific are neither optimized to address the threat of China nor can it change what China may do. The transition from gray zone warfare to a fait accompli may happen without warning, leaving improvisation as the only option. Just like the Marine Corps must "modernize for the future" to execute EABO, so too must the diplomatic conditions in the Indo-Pacific to set the conditions so improvisation does not need to occur.[84]

Although a NATO-like structure in the Indo-Pacific may not be the answer, a mutual defense commitment between the nations of the FIC will provide better strategic options for the United States and its allies to address the China threat. Working with allies and partners will require time and investment, but these relationships represent one of the greatest strengths of the United States. Its strategic advantage must shift from purely military to one that combines all of the instruments of power to enable its military operations in competition and in conflict to protect its national interests.

China is playing the long game, and the United States can too. The U.S. strategy must be a whole-of-government approach that begins with diplomacy abroad in the Rimland to balance the threat from China. To enable the Department of Defense and the SIF to succeed in EABO, it must start with a unified vision and strategy with allies and partners rooted in protecting the FIC's sovereignty. Defending the FIC requires the SIF to access geographic terrain necessary to prevent a fait accompli if deterrence fails. Diplomatic agreements for mutual defense provide the structure from which access to these areas will arise. A solution rests somewhere between a formal institution similar to NATO and the status quo in the Indo-Pacific. The answer is not binary but formulating a cohesive long-term strategy within a modern twenty-first century security architecture is necessary to preserve the international rules-based order and facilitate the ability of the United States to defend allies and partners in conflict. The United States and its allies must start looking ahead to manage global threats like China collectively.

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[83] Berger, *Commandant's Planning Guidance*, 11–12.
[84] Berger, *Commandant's Planning Guidance*, 23.

Chapter 5

Marine Corps Multidomain Reconnaissance in Great Power Competition

Major Matthew R. Hart, USMC

The *Summary of the 2018 National Defense Strategy of the United States of America* identified "the reemergence of long-term strategic competition" as the central challenge to U.S. prosperity and security.[1] The following year, the Commandant of the Marine Corps, General David H. Berger, released his planning guidance focused on building a more lethal and modern force in accordance with the strategic approaches identified in the earlier publication. With force design as the number one priority, Berger promoted realigning the Marine Corps with the naval force to create Joint Force Maritime Component Commands (JFMCC) and identified expeditionary advanced base operations (EABO) as the key concept that "will inform how we approach missions against peer adversaries."[2]

To enable EABO and answer the JFMCC commander's critical information requirements (CCIR) related to potential peer-level conflicts, the Marine Corps must possess the capability to conduct reconnaissance and surveillance of key maritime terrain based on the presence of available, persistent, and multidomain units. An available force is organic to the Marine Corps, appropriately trained, and possesses the necessary command relationships to gain the requisite authorities and permissions to conduct operational preparation of the environment. A persistent force must employ operating concepts, such as security force assistance, to gain access to the operating location, function within the weapons engagement zone (WEZ), and contribute to the Joint *kill chain*—the process of executing lethal or nonlethal actions against dynamic targets through a combination of intelligence, surveillance, and reconnaissance information and command-and-control (C2) decision making—that underpins the JFMCC's sea control and sea denial capabilities.[3] Lastly, a multidomain reconnaissance force enables the JFMCC to shape the operational environment by maintaining a Joint sensor-to-shooter capability—the process of passing targeting information to firing units—to distribute both lethality and resources no matter the level of conflict. While battalions within the Marine Expeditionary Force Information Group already possess these multidomain capabilities, they lack the requisite fieldcraft, C2, and

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[1] *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018), 4.
[2] Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019), 11.
[3] For more on the term *kill chain*, see Maj Lucas J. Teel, USAF, "The Post-GPS Era: Leveraging Advances in Precision Navigation and Targeting to Enable the Kill Chain in an A2/AD Environment" (master's thesis, Marine Corps University, 2014).

specialized skills training to survive and persist as the inside force in a conflict with a peer competitor like China. Therefore, the Marine Corps must create a multidomain reconnaissance regiment to synchronize the synergistic effects of these abilities. Without a multidomain reconnaissance capability, the Marine Corps puts the naval force at unnecessary risk resulting from an inability to confirm or deny planning assumptions, provide increased situational awareness for the inside force, and maintain the sensor-to-shooter link that affords operational flexibility to the JFMCC.

As this chapter demonstrates, the Marine Corps must develop a multidomain reconnaissance and surveillance capability to align with the new Joint competition continuum. To illustrate how this should occur, this chapter will examine the role EABO would play in a potential conflict with China and exhibits how the current organization and employment of expeditionary ground reconnaissance forces puts both the naval expeditionary and Joint force at risk. The concluding recommendations, based on the doctrine, organizational, training, materiel, leadership, personnel, facilities, and policy (DOTMLPF-P) framework, suggest a concept of employment that will enable Joint lethality to support the JFMCC's fight for sea control and sea denial in the South China Sea.

Future Operating Environment in the South China Sea

The People's Republic of China (PRC) has established a grand strategy with the aim of achieving regional dominance in the Indo-Pacific, which has serious security implications for the United States.[4] The PRC views the United States as its primary regional competitor and seeks to reverse the latter's dominance in the region regardless of the enduring vision to advance national interests. Scholars have debated whether the PRC even possesses a grand strategy, however. One Rand report from 2020 notes that "while Beijing may not possess a formal coherent master plan explicitly identified as China's grand strategy, the accumulated set of plans and strategies combined with the overall vision statements and national goals articulated by successive PRC leaders suggests otherwise."[5] The key takeaway is that perception matters and the PRC has aligned its national resources to counter what it perceives as its central threat, the United States.

For the PRC, the Chinese Communist Party, and elites in the People's Liberation Army, the United States has been the dominant menace since 1949. Tensions between the PRC and the United States thawed when the latter supported the PRC's economic rise in the 1970s, but events in the decades after convinced PRC leaders that the United States was, and would continue to be, its principal long-term compe-

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[4] For a general definition of *grand strategy* for U.S.-China relations, see Andrew Scobell et al., *China's Grand Strategy: Trends, Trajectories, and Long-Term Competition* (Santa Monica, CA: Rand, 2020), 5, https://doi.org/10.7249/RR2798.

[5] Scobell et al., *China's Grand Strategy*, 10.

tition. Pro-democracy movements that Beijing squashed in 1989 and the collapse of the Soviet Union and other Communist regimes in Eastern Europe three years later, solidified the PRC's negative view of the United States.[6] The PRC's national strategy aims to strengthen and modernize its military while employing its other instruments of national power to enhance its power projection capabilities, allowing the PRC to create a buffer zone against the United States and to expand its sphere of influence within the Indo-Pacific.[7]

The PRC has focused its military modernization, economic progress, and information campaigns on defeating the power projection of the United States, a long-standing critical capability. In early 2020, the Donald J. Trump administration summarized the effects of China's efforts, noting that Beijing has engaged in "provocative and coercive military and paramilitary activities in the Yellow Sea, the East and South China Seas, the Taiwan Strait, and the Sino-Indian border areas" and that its "military buildup threatens United States and allied national security interests."[8] The synchronization of the PRC's elements of national power, specifically through fait accompli tactics and the development of long-range precision strike capabilities, have degraded the ability of the United States to project power into the PRC's area of perceived vital interests.

China's declarations of air defense identification zones and territorial expansion in the East and South China Seas exemplify fait accompli tactics to deny U.S. forces forward basing and infrastructure essential to a networked security architecture in the Indo-Pacific. Physical distance matters to achieve critical objectives in a conflict over Taiwan or the Spratly Islands, two of the most likely areas of conflict between the United States and China. A 2015 study analyzed a conflict with China taking place in the past, present, and future. It assessed that in a future conflict, "The Taiwan and Spratly Islands scenarios suggest that Chinese power diminishes rapidly across even modest distances."[9] This conclusion illustrates that it is imperative for the PRC to control key maritime terrain that could extend the range of its cruise and ballistic missile forces as well as basing and infrastructure. Additionally, the PRC's attempts at controlling these areas along with creating sea and air exclusion zones could slowly erode the credibility of the United States with its regional allies and partners. Without them, the United States would lose access to forward basing infrastructure for sustained expeditionary capabilities, such as large runways and deep-water ports. Both of these elements are a critical requirement and vulnerability, and the trend lines are moving in a negative direction for the United States.[10]

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[6] Scobell et al., *China's Grand Strategy*, 8–9.
[7] Andrew J. Nathan and Andrew Scobell, "How China Sees America: The Sum of Beijing's Fears," *Foreign Affairs* 91, no. 5 (September/October 2012): 32–47.
[8] *United States Strategic Approach to the People's Republic of China* (Washington, DC: White House, 2020), 6–7.
[9] Eric Heginbotham et al., *The U.S.-China Military Scorecard: Forces, Geography, and the Evolving Balance of Power, 1996–2017* (Santa Monica, CA: Rand, 2015), 326.
[10] Heginbotham et al., *The U.S.-China Military Scorecard*, 326.

The other strategy that the PRC pursues is to create a mismatch in long range precision strike capabilities. This disparity forms an antiaccess/area-denial (A2/AD) infrastructure and threatens U.S. forward basing and freedom of navigation in the South and East China Seas, which protects the PRC's territorial sovereignty. By negating the U.S. military's technological advantage, China places the United States in a dilemma. According to the Marine Corps' *Expeditionary Advanced Base Operations (EABO) Handbook*, "The United States can continue to risk our most valuable military assets in increasingly vulnerable forward locations, or we can step back from our forward basing posture and risk losing credibility among treaty allies."[11] The United States has been unmatched in its ability to project power while maintaining forward-basing infrastructure through treaties and alliances.

This asymmetric advantage has allowed the U.S. military to deploy and sustain expeditionary capabilities to accomplish policy objectives since the mid-twentieth century. However, the central assumptions underpinning the American way of war during this time, which enabled the joint force to exploit its operational reach, will be challenged. This test has led the Department of Defense to generate new operating concepts and completely rethink the central assumptions underpinning conflict in the twenty-first century.

Future Operating Concepts

The U.S. military must take drastic action to compete with China and counter its threat to national security. The *Summary of the 2018 National Defense Strategy* recognizes that the United States is now contested in every domain and can no longer assume having a significant military advantage against any adversaries. To build a more lethal force, the U.S. military must modernize its capabilities, reevaluate its assumptions, and develop new operating concepts.[12] The Joint Concept for Access and Maneuver in the Global Commons (JAM-GC) is the cornerstone concept for the United States in great power competition. It outlines how Joint forces will maintain access to and maneuver through the global commons—the air, sea, space, and cyberspace domains that remain beyond the possession of any single state—against a pacing threat that can contest its ability to project power through A2/AD capabilities. JAM-GC requires a persistent, low-signature *inside force* that can leverage decisive capabilities of maneuver and mass of an *outside force*.[13] This model compels the naval expeditionary force to conduct operations in close and confined seas inside the PRC's WEZ while it coerces the Marine Corps to operate in the littorals.

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[11] Art Corbett, *Expeditionary Advanced Base Operations (EABO) Handbook: Considerations for Force Development and Employment* (Quantico, VA: Marine Corps Warfighting Lab, 2018), 13.
[12] *Summary of the 2018 National Defense Strategy of the United States*, 6.
[13] Corbett, *EABO Handbook*, 24–26; and Michael E. Hutchens et al., "Joint Concept for Access and Maneuver in the Global Commons: A New Joint Operational Concept," *Joint Forces Quarterly* 84 (1st Quarter 2017): 139n1.

To persist within the PRC's WEZ, the Navy must have sea control and sea denial, in which the Marine Corps plays a pivotal role. The Navy and Marine Corps drafted the handbook, *Littoral Operations in a Contested Environment* (LOCE), in recognition of the integration required between the services to ensure successful campaigns. This document emphasizes the need for a joint approach to addressing the PRC's A2/AD capabilities to allow naval forces to operate with freedom of action in the littorals. Central to LOCE is the ability of the JFMCC to distribute lethality and to "seek to impose increased battlespace complexity on the adversary and confound his decision calculus by forcing him to allocate sensors and shooters against a wider—and more dispersed—set of threats."[14] This strategy—ensuring the presence of an unit that persists forward—provides the joint force a credible fighting formation in case of a conflict while reassuring regional partners and allies and countering the PRC's actions.

The U.S. Marine Corps developed EABO to meet the challenges put forth in the national security strategy and explains how it will approach missions against peer adversaries.[15] While the Marine Corps is still forming the doctrines of EABO, the Marine Corps Warfighting Laboratory (MCWL) published a handbook in 2017 that establishes some of its central tenets. It states, "The EABO concept is designed to defeat adversary attempts to execute counter intervention and *fait accompli* strategies that might otherwise inhibit a credible US response to aggression against treaty allies and economic partners."[16] EABO is an enabling capability to JAM-GC and LOCE and expands the Navy's ability to distribute lethality by "providing land-based options for increasing the number of sensors and shooters beyond the upper limit of seagoing platforms available."[17] According to MCWL, "EABO advances, sustains, and maintains naval and joint sensor, shooter, and sustainment capabilities of the *inside force* to leverage the decisive massed capabilities of the *outside force* with enhanced situational awareness, augmented fires, and logistical support."[18] A Marine Corps unit postured as an EABO inside force would provide several key capabilities. First, it could act as the sensor that enables joint lethality in a contested environment and gives the JFMCC operational flexibility to shape the operating environment while also securing key maritime terrain. Second, it allows the JFMCC the opportunity to seize the strategic initiative to strike high value and high payoff targets. Third, an inside force also serves as a deterrent to increased aggression and use of force from the PRC by inserting the cost of American life into its decision-making calculus. Finally, it can counter the PRC's fait accompli strategy by working with regional partners and allies to enforce established international norms like freedom of navigation, rebuilding U.S. credibility there.

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[14] *Littoral Operations in a Contested Environment* (Washington, DC: Headquarters Marine Corps and Department of the Navy, 2017), 14.
[15] Berger, *Commandant's Planning Guidance*.
[16] Corbett, *EABO Handbook*, 5.
[17] *Littoral Operations in a Contested Environment*, 14.
[18] Corbett, *EABO Handbook*, 5.

Expeditionary operations against the PRC will require the JFMCC to understand the operating environment within the contact and blunt layers.[19] This need requires the Marine Corps to possess the critical capability to persist forward, acting as an extension of the naval force and enabling the Joint kill chain. These forces must be combat credible and ready to rapidly transition from competition to conflict.[20] The old assumption that the JFMCC could freely maneuver forces between these layers is no longer valid. As General Berger stated, "Navy-Marine forces must be able to transition from competition to crisis. We will not be able to pull out our force and put another in. Those forward forces must be able to respond immediately to create sea denial, sea control somewhere, or respond to crisis."[21] The Marine Corps must have the aptitude to operate in designated contact layers to enable the Joint force to compete more effectively below the level of armed conflict while still capable of blunting adversary aggression in support of EABO.[22] The PRC's A2/AD capacity means that Marine Corps units acting as the inside force in EABO will have to conduct distributed campaigns across a wide area to negate the PRC's ability to disrupt and break apart its kill chain, ensuring its full execution. Marine Corps reconnaissance battalions are the only conventional units that currently possess the needed intelligence, surveillance, and reconnaissance and C2 capabilities, making them ideally suited as the base intelligence maneuver element within a multidomain reconnaissance detachment.

Current State of Marine Corps Reconnaissance

The unique training and assigned missions of the Marine Corps reconnaissance battalions make them ideally suited to support EABO. These units take on numerous primary mission-essential functions that would apply during EABO, specifically providing task-organized forces, conducting specialized missions, and establishing means for command and control. To fulfill these responsibilities, the battalions employ three companies under operational control of the division and one company under operational control of the Marine Expeditionary Force (MEF) (figure 29).[23]

Due to their structure and experiences, Marine Corps reconnaissance units can provide the necessary flexibility for EABO. They could act as tactical and operational scouts by gaining access to key maritime terrain and developing battlespace awareness in the

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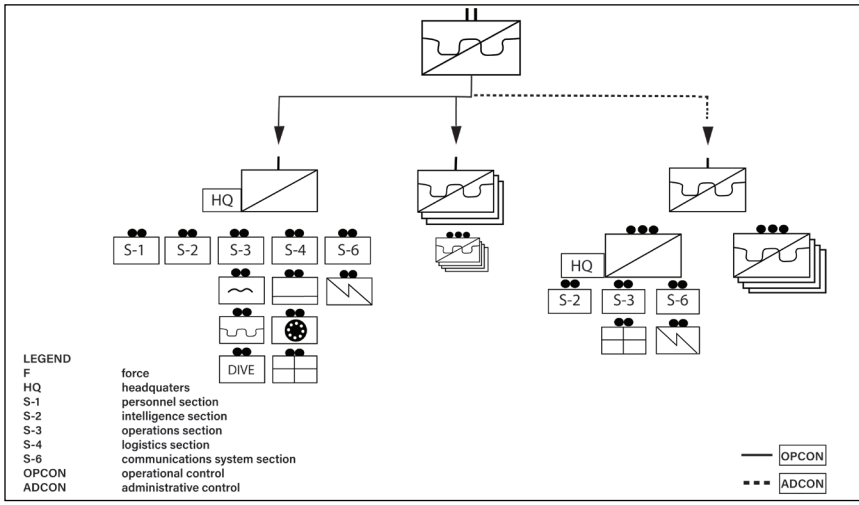
[19] The contact layer refers to actions that help the United States effectively compete with peers at a level below armed conflict. The blunt layer concerns deeds that are meant to "delay, degrade, or deny adversary aggression." For more, see Capt Dylan Warnick, USMC, "USMC+USAID=America's Contact Layer," U.S. Naval Institute *Proceedings* 145, no. 5 (May 2019).
[20] Berger, *Commandant's Planning Guidance*, 2.
[21] Gen David H. Berger, interview with Ward Carroll and Bill Hamblet, "Commandant on Marines Fighting Subs," *Proceedings Podcast*, episode 198, audio, 7 December 2020, 44:44 min.
[22] *Summary of the 2018 National Defense Strategy of the United States*, 7.
[23] *Marine Corps Order NAVMC 3500.55C, Reconnaissance Training and Readiness (T&R) Manual* (Washington, DC: Headquarters Marine Corps, 8 November 2017), 2-2.

Figure 29. Reconnaissance battalion with administrative control over a U.S. Marine Corps Force Reconnaissance Company



Source: *Ground Reconnaissance Operations*, Marine Corps Warfighting Publication 2-25 (Washington, DC: Headquarters Marine Corps, 2015), 2-10, adapted by MCUP.

littoral operating environment. Having specialized training in insertion and extraction methods ranging from high-altitude, high-opening freefall operations to over-the-horizon clandestine landings via subsurface methods, these detachments can give operational commanders options for performing nonstandard insertions based on the specific adversary situation and threat levels. After obtaining access to the operating environment, these units can conduct both lethal and nonlethal shaping actions, such as limited scale raids or producing favorable media reports, to attack an adversary's capability or force, disrupting its commander's decision making in the process.[24] The reconnaissance units' ability to limit the foe's freedom of action and deny the concentration of its combat power against the naval force contribute to the JFMCC's fight for sea control and sea denial. Additionally, their capability in performing reconnaissance maneuver and target operations allow the commander to conduct manned and persistent surveillance of an objective area, collect intelligence, and set the conditions for movement and maneuver of the force.[25] These inherent capabilities of reconnaissance units makes them uniquely suited for EABO.

Despite these units' significant skills in relation to EABO, they will face challenges from the changing responsibilities and employment of Marine Corps reconnaissance,

[24] *Ground Reconnaissance Operations*, Marine Corps Warfighting Publication 2-25 (Washington, DC: Headquarters Marine Corps, 2015), 1-7.
[25] *Ground Reconnaissance Operations*, 1-7.

which has created a capability gap in amphibious reconnaissance in support of the JFMCC. The Marine Corps amphibious reconnaissance that supports the JFMCC has its origins in a time of doctrinal innovation starting in 1906 and extending through the 1930s. In that time, three publications—*Naval Reconnaissance: Instructions for the Reconnaissance of Bays, Harbors, and Adjacent Country* by Major Dion Williams (1906), *Advanced Base Operations in Micronesia* by Major Earl H. Ellis (1921), and the U.S. Navy's Fleet Training Publication 167, *Landing Operations Doctrine* (1938)—encouraged experimentation with task-organized reconnaissance forces and demonstrated their importance in supporting amphibious landings.[26] The suggestions from these publications and the resulting experimentation culminated in the establishment of the precursor to the Marine reconnaissance unit, the Observer Group, shortly after the attacks on Pearl Harbor in December 1941.[27]

The changing character of warfare during the Korean and Vietnam wars as well as Operations Desert Shield (1990–91), Desert Storm (1991), Iraqi Freedom (2003–11), and Enduring Freedom (2001–14) has transformed the doctrinal role of Marine reconnaissance since the initial vision in 1906. In 2016, a mission analysis of expeditionary ground reconnaissance identified the impacts of 11 September 2001 (9/11) on the reconnaissance community. "Since 9/11," the authors report, "many reconnaissance (Recon) units have been employed as light infantry battalions and companies controlling battlespace in Iraq and Afghanistan, rather than small teams charged to collect information on the enemy and the environment as in the past."[28] This divergence from the doctrinal role of these forces has led to stagnation in the development of future employment concepts. Without a unified vision, leaders cannot answer any further questions that arise about employment, organization, training, manning, and equipping.

The activation of Marine Forces Special Operations Command (MARSOC) on 26 February 2006 restructured the reconnaissance battalion, which compounded the effects of changing responsibilities for the community. MARSOC's creation resulted from the successfully conducted proof of concept by MARSOC Detachment (Det One), a force reconnaissance platoon reinforced by intelligence, fires, and command headquarters (figure 30).[29] The successful performance of Det One led to 1st and 2d Force Reconnaissance Companies being transferred to MARSOC to meet the

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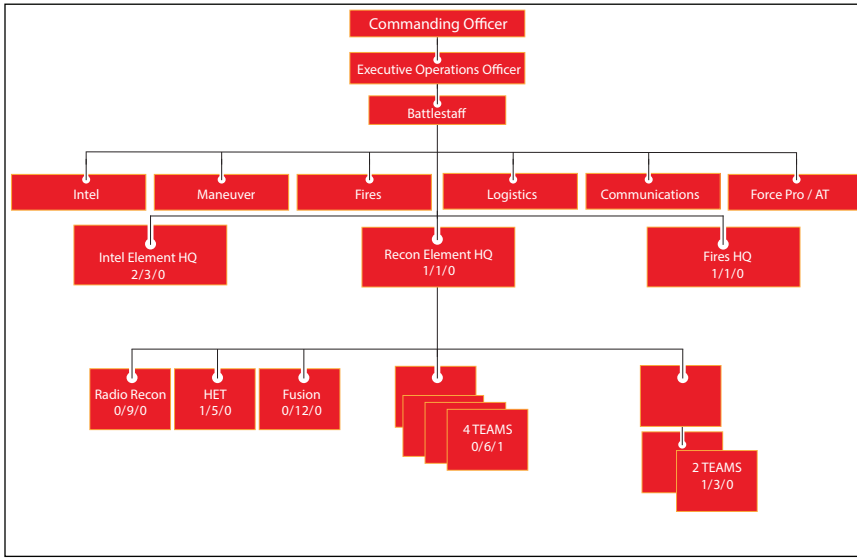
[26] Maj Dion Williams, USN, *Naval Reconnaissance: Instructions for the Reconnaissance of Bays, Harbors, and Adjacent Country* (Washington, DC: Government Printing Office, 1906); Maj Earl H. Ellis, *Advanced Base Operations in Micronesia* (Washington, DC: Division of Operations and Training, Marine Corps, 1921); and *Landing Operations Doctrine*, Fleet Training Publication 167 (Washington, DC: Department of the Navy, 1938).
[27] Col Bruce F. Meyers, USMC (Ret), *Swift, Silent, and Deadly: Marine Amphibious Reconnaissance in the Pacific, 1942–1945* (Annapolis, MD: Naval Institute Press, 2004), 1–5.
[28] Michael H. Decker et al., *Expeditionary Ground Reconnaissance: A Mission Analysis* (Santa Monica, CA: Rand, 2016), 1.
[29] LtCol John P. Piedmont, USMCR, *Det One: U.S. Marine Corps U.S. Special Operations Command Detachment, 2003–2006* (Washington, DC: Marine Corps History Division, 2010), 95.

Figure 30. Marine Corps U.S. Special Operations Command Detachment (Det One)



Source: LtCol John P. Piedmont, USMCR, *Det One*: *U.S. Marine Corps U.S. Special Operations Command Detachment, 2003–2006* (Washington, DC: Marine Corps History Division, 2010), 95, adapted by MCUP.

emergent manpower requirements of the Global War on Terrorism.[30] The respective MEFs lost their ability to conduct special operations and deep reconnaissance as a result, which led to Headquarters Marine Corps establishing Company D at 1st and 2d Reconnaissance Battalions, and a deep reconnaissance company at 3d Reconnaissance Battalion to address the shortfall and give the MEFs a force-like capability.[31] The loss of one force reconnaissance company to MARSOC, however, resulted in the forfeiture of 25 percent of the most experienced and trained Marines overnight, which is still impacting the reconnaissance community. It prevents the depth required to train and equip forces designed to operate during competition because major combat operations and crisis response requirements consume the preponderance of forces, preventing any excess capacity to focus on future activities with the PRC.

MARSOC's establishment, organizational restructuring, and changing responsibilities following 9/11 have resulted in a reconnaissance community that is unable to meet the requirements of great power competition. Reconnaissance battalions have been manned, trained, and equipped for legacy requirements rather than being prepared to meet current demands of great power competition and conflict. This factor puts the

[30] Decker et al., *Expeditionary Ground Reconnaissance*, 1.
[31] Decker et al., *Expeditionary Ground Reconnaissance*, 1.

naval expeditionary force and Fleet Marine Force at risk due to the inability to reduce uncertainty, confirm or deny assumptions, and provide the JFMCC with answers to CCIRs necessary for operational and tactical level decision making. To address these issues, the Marine Corps must envision a new threat informed concept of employment that is reinforced by changes across the DOTMLPF-P spectrum.

Solution

Great power conflict demands that the Marine Corps possess operational control of multidomain reconnaissance forces to support limited preparation of the operational environment and support amphibious advance force operations (AAFO). Operational preparation of the environment (OPE) is defined as "the conduct of activities in likely or potential operational areas to set conditions for mission execution," which helps commanders "develop knowledge of the operational environment" through actions that could include "active and passive observation, area and network familiarization, site surveys, and mapping the information environment."[32] Typically, these actions are undertaken by Special Operation Forces (SOF), which have responsibilities to conduct strategic reconnaissance—special reconnaissance and surveillance assignments to collect or verify strategic or operationally significant information in sensitive environments.[33] OPE is broader in application than AAFO. These operations are designed to "shape the battlespace in preparation for the main assault of an amphibious or Joint force by providing battlespace awareness" with various operations such as "reconnaissance, seizure of supporting positions, minesweeping, preliminary bombardment, underwater demolitions, and air support." Unlike OPE being exclusively the duty of Special Operation Forces, either Special Operation Forces or conventional forces assigned to an amphibious task force can conduct an AAFO.[34]

To enable EABO, the Marine Corps must possess an available, persistent, and multidomain reconnaissance capability to conduct AAFO and limited OPE on key maritime terrain. This capability must be organic to the Marine Corps and employed by the JFMCC because SOF is unreliable for gathering information to provide to the JFMCC.[35] When allocated, combatant commanders exercise operation control over SOF through the commander, Theater Special Operations Command (CDRTSOC) or subordinate Special Operations Component of the Joint Task Force. Unless further delegated, SOF forces will not fall under the operation control of the JFMCC.

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[32] Unified Combatant Command for Special Operations Forces, 10 U.S.C. § 167 (2021); and *Special Operations*, Joint Publication 3-05 (Washington, DC: Joint Chiefs of Staff, 2011), IV-8.
[33] Unified Combatant Command for Special Operations Forces; and *Special Operations*, GL-10.
[34] *Marine Corps Order 3500.26, Marine Corps Task List* (Washington, DC: Headquarters Marine Corps, 1 April 2017), 87.
[35] *Naval Amphibious Capability in the 21st Century: Strategic Opportunity and a Vision for Change, Report of the Amphibious Capabilities Working Group* (Washington, DC: Headquarters Marine Corps, 2012), S-4.

This SOF command structure is supported by Title 10 wargames and reinforced by Joint doctrine. Expeditionary Warrior 2012 (EW12), a Marine Corps Title 10 wargame, correctly identified the necessity for organic amphibious reconnaissance capability during advance force operations. EW12 was "intended to identify potential gaps and opportunities for enabling joint force access and entry against capable adversaries in an anti-access, area-denial environment."[36] One of the key findings of the report was that Combined Joint Task Force (CJTF) "taskings would likely preoccupy SOF that were already operating in theater . . . underscoring the need for an organic amphibious reconnaissance capability" in Amphibious Ready Groups and Marine Expeditionary Units because Marine reconnaissance personnel filled the "ranks of the U.S. Marine Corps Forces Special Operations Command" rather than fulfilling their information-gathering duties.[37] SOF forces would be preoccupied by CJTF taskings because SOF is focused on operational and strategic requirements, not tactical ones. Additionally, SOF core activities being designed to "achieve a broad range of strategic and operational objectives" and "SOF are not dedicated to conduct reconnaissance for conventional forces" would ensure this capability gap.[38]

A Joint force publication on amphibious operations supports the fact that SOF cannot support the tactical requirements of EABO. It identifies SOF as a temporary supporting organization that *may* be employed *if* requested by the JFMCC and will usually remain under operation control of the CDRTSOC. It further reinforces that SOF cannot be solely reliant to support Marine Corps EABO as it argues that commanders "should not assume the amphibious advance force will be available for tasking."[39] While neither EW12 nor the Joint force publication explicitly states that SOF lacks the capability to support the Marine Corps tactical information requirements, they should make the Service's current reliance on SOF to fulfill information gaps uneasy. Due to the possibility that SOF will not satisfy all Marine Corps and JFMCC requirements, the Marines Corps needs to develop a complementary capability to fill critical collection gaps.

The PRC's ability to contest U.S. air and maritime superiority and assured communications demands a force that can survive and persist forward within its WEZ with operationally relevant capabilities. The ability to conduct security force assistance with partner and allies to contest key maritime terrain is a critical requirement to achieve forward presence. These operations will improve allied and partner nations' reconnaissance capabilities, enable access to competition spaces, and provide interoperability with both U.S. and foreign SOF. Operating with SOF prior to conflict will offer a more nuanced understanding of the operating environment as well as enable it to focus on operational and strategic targets while Marine reconnaissance units bring Joint forces ashore in the transition from competition to conflict.

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[36] *Expeditionary Warrior 2012: EW12 Final Report* (Quantico, VA: Marine Corps Warfighting Lab, 2012), i.
[37] *Expeditionary Warrior 2012*, 16.
[38] *Special Operations*, II–4-5.
[39] *Amphibious Operations*, Joint Publication 3-02 (Washington, DC: Joint Chiefs of Staff, 2011), VI–4-5.

Marine reconnaissance units must be survivable and possess operationally relevant capabilities, especially when dealing with the hider/finder competition alluded to in the *EABO Handbook*. "The hider finder competition," it states, "will be the most pervasive and salient requirement . . . the ability to see first enables the ability to shoot first, and in naval warfare there is significant advantage to shooting first."[40] Multidomain reconnaissance units should be proficient in remaining undetected while possessing the manned and unmanned sensors required to complete the joint kill. Through persistent human observation by trained decision makers, multidomain reconnaissance units can achieve an understanding of their operating environment that an automated system cannot replicate.

To disrupt the PRC's robust intelligence, surveillance, and reconnaissance (ISR) network and capabilities, Marine reconnaissance units must possess multidomain abilities to maximize survivability through counter-reconnaissance and close collection gaps by developing a complete picture of the geographic, information, and human elements of the operating environment. Lieutenant Colonels Sean Barnes and Ladd W. Shepard describe the potential use of reconnaissance Marines and unmanned technologies.[41] Leveraging emerging equipment like unmanned aerials and submersibles, electronic decoys, and unattended ground sensors will permit reconnaissance teams to lower their electronic signature and obfuscate their physical signature from adversary detection. These resources extend the operational reach of the JFMCC by increasing friendly sensor and shooter capacity while disrupting adversary command and control and ISR capabilities through lethal and nonlethal effects. It also complicates the adversary's decision-making cycle as it is an easier decision to target a robot versus a human being.

The Marine Information Group, specifically Radio Battalion and the Battlefield Surveillance Company within the Intelligence Battalion, already possess these multidomain capabilities. Yet, these units lack the requisite fieldcraft, command and control, and specialized skills training to survive and persist within the WEZ in a conflict with the PRC. To maximize the synergistic effects of reconnaissance, intelligence, and radio battalions, the Marine Corps must form a reconnaissance regiment, which could be a Joint solution to a Joint problem.

Still, creating a reconnaissance regiment requires a DOTMLPF-P solution to align the doctrine with new employment concepts that will drive the organization, training, and equipping of it. The Marine Corps must advocate for the revision of Joint Service doctrine to define the requirement for conducting its own limited OPE and AAFO activities. Currently, the Marine Corps only has a task to conduct AAFO, which is separate and distinct from OPE as well as tied to forcible entry operations.

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[40] Corbett, *EABO Handbook*, 25.
[41] LtCol Sean Barnes and LtCol Ladd W. Sheppard, "Manned and Unmanned Teaming: The Future of Marine Corps Reconnaissance Units," *Marine Corps Gazette* 102, no. 5 (May 2018): 47.

As a consequence, it is too narrow, leaving it limited in conducting clandestine OPE activities to support EABO.

Employment of multidomain reconnaissance units will require detailed synchronization and coordination with the Joint force, to include the CDRTSOC or designated SOF Task Force. Current command relationships do not posture the reconnaissance community to collect information while in competition and the Marine Corps must make three changes to employ multidomain reconnaissance capabilities. First, it must form regionally aligned multidomain reconnaissance regiments aligned with their respective Marine component commands. These units should be built around a reconnaissance battalion reinforced with a battlefield surveillance company of manned and unmanned sensors, a radio reconnaissance platoon, human intelligence collectors, all source and geospatial analysts, and a mobility company to meet the enhanced maritime movement for operating in the littorals. As identified by Major William Willis and Lieutenant Colonel Sean Barnes, the combined effects of these units could "collect, spoof, jam, attack, kinetically and non-kinetically shape."[42] Second, this unit must be integrated into the Marine Corps ISR enterprise. This integration would enable reconnaissance forces to be under collection managers and have the command relationships to think and plan for operations in support of the JFMCC specifically. While the exact command relationships are unclear due to the ambiguity of current force design efforts, the Marine component commands are probably best suited for operational control of this capability because of its unique position with the combatant, fleet, and CDRTSOC. This relationship would allow the Marine Corps to have the authority to plan and conduct OPE activities in support of the JFMCC. Third, the Marine Corps must create place reconnaissance planners at the combatant, fleet, and theater Special Operations Command to ensure unity of effort and deconfliction.

The overreliance on SOF has resulted in a training and certification shortfall for Marine reconnaissance units. The Marine Corps should add security force assistance to the reconnaissance battalion's mission essential task list.[43] This change will allow the units to devote time and resources to training and employing this capability. The reconnaissance regiment must train to reach special operations baseline interoperability standards, which will give Marines access to tradecraft training that is useful in more politically and physically challenging environments. The Marine Corps needs to advocate for Special Operations Command accreditation of all courses taught by each MEF's Expeditionary Operations Training Group as these courses directly sup-

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[42] LtCol Sean Barnes and Maj William Willis, "Future Reconnaissance: Reducing Human Sensors," *Marine Corps Gazette* 103, no. 5 (May 2019): 29.

[43] While the reconnaissance regiment must maintain its ability to conduct inshore maritime raids, it is recommended that the capability to conduct maritime interdiction operations, specifically visit, board, and search and seizure, be tasked to another unit.

port the collective training requirements of the reconnaissance regiment to conduct clandestine preparatory activities.

The current acquisition system of the Marine Corps is not conducive to the rapid procurement of equipment required to maintain a competitive advantage. The Marine Corps has to pursue other avenues of funding and acquisition to enable operations. The multidomain reconnaissance regiment should invest heavily in littoral mobility platforms, unmanned and autonomous platforms, and exquisite communication technology to ensure they can communicate in a denied or degraded environment.

Senior leadership needs to posture the Marine Corps to conduct limited preparation of key maritime terrain during great power competition, permitting the alignment of authorities and permissions to conduct these activities. The Service must educate its junior and mid-level leadership on the clandestine shaping actions needed to support EABO. Information requirements critical to the JFMCC must be identified in detail within operational and contingency plans and be tasked for collection by the component's collection manager. The Marine Corps will not be able to surge collection capability forward post conflict and its leaders must make a concerted effort to be proactive and use reconnaissance pull to identify and exploit weakness in the adversary's system.

The Marine Corps must adopt an objective baseline screening assessment for personnel assigned to the reconnaissance regiment. These evaluations should include psychological screenings to ensure personnel have mental acumen and stamina to conduct isolated, clandestine activities with little to no support or reinforcements. The unit should also include only personnel eligible for a top secret/sensitive compartmentalized information clearance.

Current facilities have limited access to classified workspaces up to the secret level with little to no capability to access top secret/sensitive compartmentalized information. Reconnaissance regiments and forward-deployed units must work out of sensitive compartmented information facilities to ensure access to collection requirements and conduct processing, exploitation, and dissemination of the collected information.

The Marine Corps must work with the Joint force and Department of Defense to establish a policy that mirrors the Defense Intelligence Analysis Program intelligence function codes. This framework establishes "lanes in the road" to ensure limited resources are properly aligned to address the requirements in the National Intelligence Priority Framework. The Joint force can create a similar policy to ensure unity of effort and synchronize the unique collection capabilities of each Service. Once that policy is established, the Marine Corps can then generate subsequent policies to codify certification requirements for OPE activities.

Conclusion

The employment of a multidomain reconnaissance force will be critical for the Marine Corps to achieve EABO in a future conflict in the South China Sea. In this scenario,

the PRC will seek to leverage its distinct numerical and technological advantage in precision fire capabilities to conduct a mass surprise attack against high payoff targets. Due to its strategic culture of risk aversion and application of Jominian principles, the PRC will want to confirm the effects of its assaults before committing to any offensive ground actions. A multidomain, forward postured reconnaissance team can achieve maritime domain awareness for the JFMCC. In this situation, a multidomain reconnaissance team has been building maritime domain awareness for nearly six months while based in key maritime terrain. The team has gained access to the area of operations by working with a host nation force to develop maritime domain awareness for the JFMCC by passively collecting on the electromagnetic spectrum and reporting on key terrain.

The hyper-local context the team has gained allows it to identify key adversary command and control networks, detect vulnerabilities in the A2/AD network, and identify key terrain to deploy unmanned sensors and decoys that simultaneously increases the team's survivability and degrades the adversary's firepower system. The ongoing sensing activities would enable the team to identify and report an escalatory deviation.[44] These indications and warnings of an attack would provide the JFMCC both time and space for decision making. The team would immediately deploy its suite of unmanned and autonomous sensors and decoys that will jam targeted communication nodes and obfuscate the adversary's targeting picture by flooding the area with potential high payoff targets, disrupting, denying, and degrading the adversary's decision making in the process. The vulnerabilities in the adversary's A2/AD system would allow Marine Forces Cyber Command to build a cyber weapon designed to defeat it. The team requests permission to employ the cyber weapon from the JFMCC, who would, while working within their established authorities, coordinate with Marine Forces Cyber Command to introduce it to degrade the network. As trained human decision makers nested within the JFMCC's collection plan and as part of the larger Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise, the team then transitions to selectively distributing lethality and resources. This shift gives the JFMCC operational flexibility in the employment of both kinetic and nonkinetic fires to achieve sea control and sea denial to impose cost on the adversary's high value targets and introduce decisive combat forces into the area of operations.

Reconnaissance employed late is worthless and will prevent the Marine Corps from gaining access to key maritime terrain to support EABO and the JFMCC's fight for sea control and sea denial. The Marine Corps must preemptively position its reconnaissance assets to conduct limited OPE and AAFO if it wants to continue to live up to its mantra of being the "first to fight." The Marine Corps does not currently

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[44] *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: Headquarters Marine Corps, 2021), 4-1.

possess the doctrine, organization, and employment concepts to conduct limited OPE activities in support of EABO and the JFMCC's fight for sea control and sea denial in a conflict with the PRC and will continue to falsely believe SOF will be there when most needed unless it makes bold changes now. A multidomain reconnaissance regiment enabled with the training, resources, and authorities to persist forward is the only way for the Marine Corps to support the larger naval campaign in the contested seas. The ability to see and strike first is a critical capability that the Marine Corps cannot afford to get wrong.

Chapter 6

Preparing to Confront China in Armed Conflict and the Gray Zone

Major Kendall J. Ignatz, USMC

The U.S. national security establishment identifies China as its "pacing challenge" due to China's growing military and global influence.[1] Recognizing China's increasing sway and the threat that it poses to U.S. interests, it is important to explore how the U.S. military can most efficiently commit and expend resources as it prepares to defend against China across the competition continuum. Nothing guarantees how China will engage the United States in future competition or conflict. The future threat environment is uncertain, making attempts by the United States to prepare for every contingency neither financially nor practically feasible. This reality means that the U.S. military must prepare to respond to a range of threats, but limited financial resources require military and political officials to prioritize investment in certain areas over others.

The research in this chapter intends to provide readers with an understanding of the aspects that the U.S. military should prioritize and invest in to most effectively counter Chinese actions, regardless of whether those actions manifest as armed conflict or gray zone tactics. Specifically, the U.S. military should give preference to investments in cyberspace; command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); training of personnel; and allies and partners because those factors enable the U.S. military to affect China in both armed conflict and the gray zone.

It is useful to offer definitions of four key terms to provide clarity for this study. The two most prominent terms associated with this research are *armed conflict* and the *gray zone*. Armed conflict is "a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths."[2] The gray zone includes any coercive actions short of armed conflict employed by at least one state against another or multiple states.[3] The third term, *competition continuum*, denotes

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[1] *Defense Budget Overview: United States Department of Defense Fiscal Year 2022 Budget Request* (Washington, DC: Office of the Undersecretary of Defense, 2021), 1-1.

[2] Peter Wallensteen and Margareta Sollenberg, "Armed Conflict, 1989–2000," *Journal of Peace Research* 38, no. 5 (September 2001): 643, https://doi.org/10.1177/0022343301038005008.

[3] Frank G. Hoffman, "Examining Complex Forms of Conflict: Gray Zone and Hybrid Challenges," *Prism* 7, no. 4 (2018): 36; Michael Green et al., *Countering Coercion in Maritime Asia: The Theory and Practice of Gray Zone Deterrence* (Washington, DC: Center for Strategic and International Studies, 2017), 21; Lyle J. Morris et al., *Gaining Competitive Advantage in the Gray Zone: Response Options for Coercive Aggression Below the Threshold of Major War* (Santa Monica, CA: Rand, 2019), 8, https://doi.org/10.7249/RR2942; and Thomas Dobbs et al., *Grey-Zone Activities and the ADF: A Perry Group Report* (Canberra: Australian Defence College, 2020), 3.

"a world of enduring competition conducted through a mixture of cooperation, competition below armed conflict, and armed conflict."[4] These three terms appear extensively in this chapter.

A fourth term, *hybrid warfare*, is sometimes confused for or used interchangeably with the gray zone among other terms. Hybrid warfare, which Russia's 2014 annexation of Crimea exemplified, is "an operational approach to warfighting that uses an explicit mix of military and non-military tactics."[5] Conversely, scholar Frank G. Hoffman illustrates that hybrid warfare, irregular warfare, terrorism, and conventional warfare are all forms of armed conflict. He notes that gray zone actions remain below the threshold of armed conflict, emphasizing that hybrid warfare is a subset of the latter.[6] Although two different forms of competition, the confusion about the disparity between the gray zone and hybrid warfare likely occurs because actors may use certain tactics, such as cyberattacks, in both instances. The most significant difference is that hybrid warfare also incorporates an armed military component. Hybrid warfare and the gray zone are not synonymous, despite similarities in the tactics employed.

Militarily, China could compete or engage in conflict with the United States across the competition continuum, ranging from minor nonlethal actions to overt, large-scale war. Actions in the gray zone differ from those associated with war or armed conflict on the other end of the spectrum.[7] China's ability to operate across the competition continuum creates a dilemma for the U.S. military because the United States cannot confidently predict whether China will employ gray zone actions as well as engage in armed conflict, if not committing to this solely. As such, there is a tendency to prepare for the worst or most dangerous scenario—armed conflict—despite logic suggesting that any Chinese attempts to engage the United States in such a struggle would potentially result in devastating outcomes for both nations. To that point, some pundits observe that "the Pentagon has seemingly shifted to single-mindedly preparing for a traditional, conventional great-power conflict it is unlikely to ever fight—while drastically decreasing training for the proxy wars, civil conflict, and insurgencies it will inevitably be called upon to help win."[8] The problem for the U.S. military is whether to prepare for and invest in capabilities and factors aligned with the more likely scenario of gray zone actions or the more dangerous, but less likely, situation of armed conflict. This dilemma raises a significant question: How should the U.S. military invest in order to prepare for and create the flexibility to counter China in both the gray zone and armed conflict?

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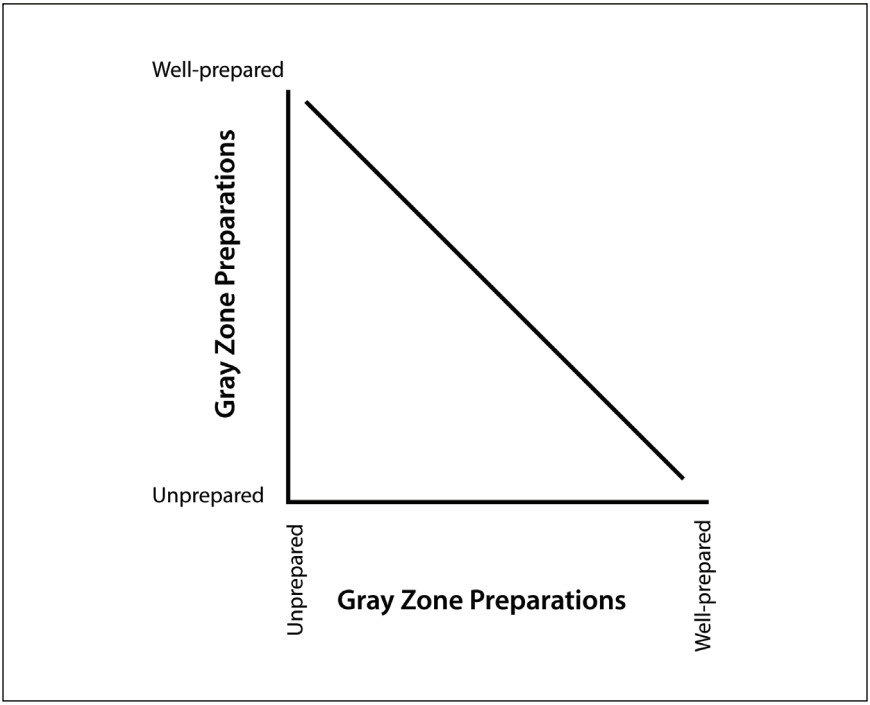
[4] *Competition Continuum*, Joint Doctrine Note (JDN) 1-19 (Washington, DC: Joint Chiefs of Staff, 2019), v.
[5] Bettina Renz, "Russia and 'Hybrid Warfare'," *Contemporary Politics* 22, no. 3 (2016): 283, https://doi.org/10.1080/13569775.2016.1201316.
[6] Hoffman, "Examining Complex Forms of Conflict," 32.
[7] Anthony H. Cordesman and Grace Hwang, *Chinese Strategy and Military Forces in 2021* (Washington, DC: Center for Strategic and International Studies, 2021), 82; and Jeremy A. Oliver, "China's Maritime Militias: A Gray Zone Force" (master's thesis, Naval Postgraduate School, 2019), 41–42.
[8] John Vrolyk, "Insurgency, Not War, Is China's Most Likely Course of Action," *War on the Rocks*, 19 December 2019.

Figure 31. Gray zone preparations impact on armed conflict preparations



Source: Anthony H. Cordesman and Grace Hwang, *Chinese Strategy and Military Forces in 2021* (Washington, DC: Center for Strategic and International Studies, 2021), 82; Jeremy A. Oliver, "China's Maritime Militias: A Gray Zone Force" (master's thesis, Naval Postgraduate School, 2019), 41–42; and John Vrolyk, "Insurgency, Not War, Is China's Most Likely Course of Action," *War on the Rocks*, 19 December 2019.

Based on the current position of U.S. military leadership, an inverse relationship exists between its gray zone preparations and armed conflict preparations (figure 31). This hypothesis contends that the more the United States prepares to counter China in the gray zone, the less prepared it will be to confront China in armed conflict and vice versa. This premise proved useful in addressing the issue connected to the research question. Yet, the research illustrates that the hypothesis does not, in many cases, accurately reflect the relationship between preparation for the gray zone and preparation for armed conflict.

An uncertain future may prompt the United States to waste resources if it invests in expensive areas applicable to armed conflict with China, especially when considering that China may choose to operate in the gray zone, thereby rendering some U.S. military components irrelevant. At the same time, it is foolish for the United States to avoid investment in armed conflict as doing so makes it vulnerable to armed Chinese

aggression. There is a balance that simultaneously promotes U.S. military preparation across the competition continuum while allowing for responsible expenditure of taxpayer dollars. By prioritizing investment in areas applicable to both the gray zone and armed conflict and through the implementation of methods designed to surge capabilities or accelerate preparations specific to either aspect, the U.S. military can responsibly fund itself and enable itself to confront China along any part of the competition continuum.

A framework provided guidance and established a scope for this research. By exploring the China problem from the standpoint of the U.S. Department of Defense (DOD), this chapter foregoes Chinese-U.S. diplomatic relations, economics, and other nonmilitary realms. Additionally, it explores the topic from a holistic DOD view instead of a Service-specific perspective. Specifically, it examines the military aspects of U.S.-China relations through the lens of *Competition Continuum*, which notes how three parts—cooperation, competition below armed conflict, and armed conflict—compose the competition continuum.[9] While cooperation is a significant factor in nation-to-nation relations, it is excluded here due to the emphasis on the military aspects of the U.S.-China relationship, making armed conflict and competition below armed conflict or gray zone portions of the competition continuum the central concepts. Distilling the competition continuum to two main components is useful because it prevents the tendency to examine an unwieldy number of ways in which China may engage with the United States, allowing for a focused and deliberate research effort.

This chapter is broken down into five sections that examine multiple aspects of the military elements of the U.S.-China relationship. The first segment further defines armed conflict and examines China's capabilities related to it. The second section outlines the gray zone and discusses how China acts within this variable. Having defined and provided an understanding of these two areas, the third part compares and contrasts the elements, analyzing the extent to which aspects of U.S. military power enable it to counter China in both armed conflict and the gray zone. The fourth portion provides an assessment of the factors that the United States should focus on and invest in to provide the flexibility necessary to respond to China across the competition continuum. The conclusion offers suggestions for how others can build on this research topic. This approach is meant to provide an appreciation of the Chinese threat and to explore U.S. options., and suggest a concept for how the U.S. military can balance finite resources and confront China across the competition continuum. To do so, the U.S. military should invest in areas applicable to both armed conflict and the gray zone, such as cyberspace, C4ISR, the training of personnel, and allies/partners, and should develop methods to accelerate preparations specific to either armed conflict or the gray zone.

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[9] *Competition Continuum*, v.

Variable 1: Armed Conflict

The above definition of armed conflict, based on the work of two Uppsala University researchers, conveys the idea that these confrontations include actions considered part of conventional or traditional warfare as well as other actions, such as terrorism, irregular warfare, and hybrid warfare.[10] The notion that armed conflict can take multiple forms enables a better understanding of the various methods and aspects applicable to China's execution of armed conflict, which facilitates an understanding of the requirements the United States must meet for countering China in armed conflict.

For each of these aspects of armed conflict, China maintains a deft ability to engage other nations, including the United States. Specifically, the Chinese People's Liberation Army (PLA) meets or exceeds the United States with respect to its shipbuilding, land-based conventional ballistic missiles, cruise missiles, and integrated air defense system. The land-based elements of the PLA—the People's Liberation Army Ground Force—and its naval elements—the People's Liberation Army Navy—are both the largest in the world.[11] The People's Liberation Army Air Force is the third largest in the world, and the People's Liberation Army Rocket Force continues to expand both its conventional and nuclear missile capabilities (figure 32).[12] As China increases its overseas basing and logistics infrastructure, it enables the entire PLA to extend its range and sphere of influence.[13] Rand researchers summarized the effects of China's recent military improvements, noting that "it is increasingly likely that a conflict [between China and the United States] could involve inconclusive fighting with steep losses on both sides."[14] These observations demonstrate China's increased military prowess and its potential ability to contest the United States in armed conflict.

Figure 32 places the PLA in a numerical context. While the Chinese military contains an immense number of personnel and materiel, a few caveats are necessary to address the figures. For instance, the United States and China field different types, models, and series equipment that requires one to guard against concluding that a numerical discrepancy equates to a strength disparity. Additionally, the totals between the U.S. military and the PLA do not account for other factors, such as training, proficiency, equipment maintenance, and doctrine, that contribute to the effectiveness of a military force. Despite these stipulations when comparing the U.S. and Chinese militaries, the figures illustrate that China has the ability to threaten the United States in armed conflict.[15]

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[10] Wallensteen and Sollenberg, "Armed Conflict," 643; and Hoffman, "Examining Complex Forms of Conflict," 32.
[11] *Military and Security Developments Involving the People's Republic of China, 2020: Annual Report to Congress* (Washington, DC: Department of Defense, 2020), vii.
[12] *Military and Security Developments Involving the People's Republic of China, 2020*, viii.
[13] *Military and Security Developments Involving the People's Republic of China, 2020*, x.
[14] David C. Gompert, Astrid Stuth Cevallos, and Cristina L. Garafola, *War with China: Thinking Through the Unthinkable* (Santa Monica, CA: Rand, 2016), iii–iv, https://doi.org/10.7249/RR1140.
[15] Cordesman and Hwang, *Chinese Strategy and Military Forces in 2021*, 82.

Figure 32. Comparative size of U.S. and Chinese military forces, 2020

Category	U.S.	China
Defense expenditures ($U.S. billions)	730	225+
Defense Budget	685	181
Active military personnel	1,379,800	2,035,000
Reserved military personnel	849,850	510,000
Nuclear–powered ballistic missile–carrying submarines	16	4
Intercontinental ballistic missiles	400	98
Intermediate-range ballistic missiles	-	72
Medium-range ballistic missles	0	174
Nuclear bombers	112	-
Army active personnel	481,750	975,000
Main battle tanks	2,389	5,850
Other armored fighting vehicles	4,810	6,950
Artillery (towed, self-propelled, multiple rocket launcher)	5,444	6,194+
Surface-to-surface missiles	1,407	?
Attack helicopters	714	270+

Category	U.S.	China
Navy active personnel	337,100	250,000
Tactical nuclear submarines	53	6
Tactical conventional submarines	0	48
Principal surface combatants	121	82
Aircraft carriers	11	1
Combat capable aircraft	981	404
Anti-surface warfare helicopters	269	28
Cruisers	24	1
Destroyers and frigates	86	80
Patrol and coastal combatants	84	209
Principle amphibious ships and landing ships	40	6
Mine warfare	11	54
Marine active personnel	186,300	25,000
Tanks	447	?
Armored fighting vehicles	1,895	217+
Artillery	1,452	40+
Combat capable aircraft	432	-
Attack helicopters	145	-

Category	U.S.	China
Air Force active personnel	332,650	395,000
Combat capable aircraft	1,522	2,517
Bomber	139	176
Fighter ground attack	969	794+
Fighter	-	759
Attack	143	140
Electronic warfare	75	69
Airborne early warning	31	13
Tanker	178	13
Transport / airlift	331	270+
Long range surface–to–air missle launch units	480+	516+

Source: *Military and Security Development Involving the People's Republic of China, 2020: Annual Report to Congress* (Washington, DC: Department of Defense, 2020).

Armed conflict between the United States and China can manifest in a variety of ways. For example, a 2016 Rand study argues that war between the two countries would likely take one of four forms: brief and mild, brief and severe, long and mild, or long and severe.[16] This idea further complicates matters because one cannot fully rule out the possibility of armed conflict breaking out in some form simply because a certain scenario, such as the clashing of U.S. and Chinese ground forces, seems improbable. An armed conflict with China could involve targeted missile strikes, naval engagements, or a host of other activities that meet its definition, but do not resemble conventional state-on-state wars, such as World War II. Regardless of whether war between the United States and China is brief or long and mild or severe, the fact remains that both nations have the means to use armed force that "results in at least 25 battle-related deaths."[17]

Based on this severity variable, the two nations could experience significantly different forms of warfare. A mild war—whether brief or long—involves limited casualties, sporadic fighting, and tight political control, while a severe war may include Chinese attacks on U.S. aircraft carriers and/or U.S. strikes on Chinese soil. Any armed conflict between the United States and China could involve anything from skirmishes at the tactical level to a major conflict that may impact the international order. With respect to capabilities, the two militaries could employ anything from small conventional weapons up to nuclear weapons, although researchers predict that China would use nuclear weapons only in dire circumstances.[18] Due to the wide spectrum of military assets and activities that could characterize an armed conflict between the United States and China, both militaries would need to prepare for the abundant possibilities.

The array of Chinese weapons and systems would allow it to engage the United States in an armed conflict. According to a 2019 report from the State Council Information Office of the People's Republic of China (PRC), it has "new and high-tech weaponry and equipment," including Type 15 tanks, Type 052D guided missile destroyers, Changdu J-20 stealth fighters, and Dong Feng-26 intermediate and long-range ballistic missiles.[19] The following year, the U.S. Office of the Secretary of Defense reported to Congress that China will most likely increase the number of warheads on land-based intercontinental ballistic missiles that can threaten the United States to 200 by 2025.[20] The document also indicates that China maintains a 4,500-kilometer conventional strike capability and a 13,000-kilometer nuclear ballistic missile range. In addition, China can threaten U.S. vessels with long-range antiship

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[16] Gompert, Cevallos, and Carafola, *War with China*, 25.
[17] Wallensteen and Sollenberg, "Armed Conflict," 643.
[18] Gompert, Cevallos, and Carafola, *War with China*, 25, 29–30.
[19] *In Their Own Words: China's National Defense in the New Era* (Beijing, China: Foreign Languages Press, 2019), 7–13, 22–34.
[20] *Military and Security Developments Involving the People's Republic of China, 2020*, 55.

cruise missiles.[21] The PLA persists in improving its strike, air and missile defense, and antisurface capabilities in conjunction with information, cyber, space, and counterspace amenities in a collective antiaccess/area-denial (A2/AD) effort designed to "dissuade, deter, or, if ordered, defeat third-party intervention during a large-scale, theater campaign such as a Taiwan contingency."[22] These capabilities underscore the reality that China has the means to contest the United States, which the U.S. military cannot ignore or dismiss. These capacities would allow the PRC to produce "25 battle-related deaths" if it ever engaged the United States.[23] The assets that China could employ provides insight into which areas the United States needs to focus to counter China in armed conflict. A2/AD, naval, and strike capabilities, for example, will require the United States to equip and prepare itself to mitigate those threats without concentrating solely on them.

Variable 2: The Gray Zone

The PRC has the ability to operate below the level of armed conflict by conducting gray zone actions as well. The definitions of gray zones vary depending on the author or organization. Most descriptions for gray zone stress how states promote their interests without triggering activities, such as "armed organized violence," "war," or "conventional military response."[24] Australia's Perry Group contends that "grey-zone activities are coercive statecraft actions short of war."[25] While other entities and authors provide different definitions, the overarching premise is that gray zone actions attempt to achieve a state's goal by avoiding armed conflict. Based on the inputs of established gray zone authors, this chapter defines gray zone conflict as any coercive actions short of armed conflict that one or more states employ, endorse, sponsor, or support against one or more opposing states.[26]

Specific traits and tactics characterize China's gray zone approach. Antullio J. Echevarria II explains that the PRC's recent actions in the South China Sea are acts of coercion, deterrence, or both.[27] Another set of researchers expound on Echevarria's observations, noting that China applies military intimidation, paramilitary activities, cooption of state-affiliated businesses, manipulation of borders, information operations, legal and diplomatic measures, and economic coercion as part of its gray

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[21] *Military and Security Developments Involving the People's Republic of China, 2020*, 57–59.
[22] *Military and Security Developments Involving the People's Republic of China, 2020*, 72.
[23] Wallensteen and Sollenberg, "Armed Conflict," 643.
[24] Hoffman, "Examining Complex Forms of Conflict," 36; Green et al., *Countering Coercion in Maritime Asia*, 21; and Morris et al., *Gaining Competitive Advantage in the Gray Zone*, 8.
[25] Dobbs et al., *Grey-Zone Activities and the ADF*, 3.
[26] Hoffman, "Examining Complex Forms of Conflict," 36; Green et al., *Countering Coercion in Maritime Asia*, 21; Morris et al., *Gaining Competitive Advantage in the Gray Zone*, 8; and Dobbs et al., *Grey-Zone Activities and the ADF*, 3.
[27] Antulio J. Echevarria II, *Operating in the Gray Zone: An Alternative Paradigm for U.S. Military Strategy* (Carlisle, PA: U.S. Army War College Press, 2016), 19.

zone approach in East and Southeast Asia.[28] China may employ "targeted insurgency campaigns against the United States, its allies, and security partners" to avoid high intensity armed conflict.[29] The PRC retains a number of options for imposing its will in the gray zone.

China employs paramilitary, economic, energy, diplomatic, and informational components to further its national interests in the gray zone without engaging in an armed conflict. With respect to paramilitary means, the PRC uses fishing fleets and aircraft to establish a presence in disputed areas and overwhelm the activities of other claimants. Economically, it can leverage aid and trade deals, levy sanctions, and employ energy agreements to gain compliance from other actors. Diplomatically, the PRC coerces other states to side against its adversaries while attacking them informationally through public statements criticizing their actions and developing narratives in support of its own initiatives.[30] China quotes treaties out of context, hypocritically alleges violations of international law, and takes other measures to manipulate the information environment in its favor.[31] All of these tactics are methods for China to pursue its national interests while avoiding armed conflict.

In the future, China will most likely favor fighting in the gray zone over conducting an armed conflict, especially against a formidable adversary such as the United States. To that point, PLA specialists expect the PRC to embrace a concept known as "three non" warfares that is based on "non-contact," "non-linear," and "non-symmetric" operational modes.[32] This notion indicates the likelihood that PRC gray zone actions will remain rampant while its conventional military operations will serve a supporting role. Although the gray zone often provides incremental gains, these achievements are preferable to the potentially disastrous effects of armed conflict.[33] The PRC may possibly be so willing to avoid a direct confrontation that they would even readily "step backwards to ease tensions and preserve the capability for long-term progress."[34] In any case, the United States can expect the PRC to continue to undermine U.S. interests through gray zone actions.

Due to China's emphasis on gray zone actions, it is important for the U.S. military to understand its role in this type of conflict. Gray zone tactics use "all instruments of national power, particularly non-military and non-kinetic tools."[35] While these methods often relegate military power to a supporting role, China's use of gray zone actions frequently contains a military or paramilitary component, such as military

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[28] Morris et al., *Gaining Competitive Advantage in the Gray Zone*, 30–38.
[29] Vrolyk, "Insurgency, Not War, Is China's Most Likely Course of Action."
[30] Dobbs et al., *Grey-Zone Activities and the ADF*, B-1.
[31] Jonathan G. Odum, "Understanding China's Legal Gamesmanship in the Rules-Based Global Order," in *China's Global Influence: Perspectives and Recommendations*, ed. Scott D. McDonald and Michael C. Burgoyne (Honolulu, HI: Daniel K. Inouye Asia-Pacific Center for Security Studies, 2019), 193.
[32] Hoffman, "Examining Complex Forms of Conflict," 33–34.
[33] Peter Layton, "Countering China's Gray Zone Strategy," *Small Wars Journal*, 10 October 2021.
[34] Dobbs et al., *Grey-Zone Activities and the ADF*, B-1.
[35] Layton, "Countering China's Gray Zone Strategy."

intimidation, forcing the U.S. military to maintain a role in it.[36] China's actions in the Spratly Islands, which date back to the 1990s, highlight how the PRC employs paramilitary units and activities, such as armed fishing fleets or maritime militias, to support island reclamation and militarization.[37] Most likely, the PRC will continue to employ this component, although it may adapt these tactics to changing situations.

Similar to previous proxy wars between the United States and Soviet Union, China may operate in the gray zone by inciting or supporting anti-U.S. insurgencies to avoid direct conflict while still creating a military problem for the United States.[38] Beyond physical confrontations, the likelihood of cyberattacks during gray zone operations demonstrates the importance of cyberspace military capability.[39] Despite the gray zone largely evading traditional kinetic military action, military capabilities remain important to China's gray zone activities. In the future, the United States will have to employ military capabilities in the gray zone against China.

Analysis

Based on these concepts of armed conflict and gray zone actions, this section analyzes aspects of the U.S. military and how these apply to these types of engagements. Because this project explores these elements through a U.S. military framework, the areas featured are most prevalent in the DOD. While some of the capabilities and factors are unique to a specific service or combatant command and others exist throughout the DOD, all of the elements discussed contribute to the military instrument of power.

A number of documents and authors provide recommendations for how the United States can counter China in the future, with certain aspects, including nuclear forces, recognizing space and cyberspace as warfighting domains, C4ISR, and Joint lethality in contested environments, among others, being covered here (figure 33). Although the *Summary of the 2018 National Defense Strategy of the United States* provided the basis for the factors analyzed in this chapter, the capabilities listed within it are a consolidation of recommendations from numerous defense authorities based on trends in those works.[40] For instance, one Rand study argues that the United States must make preparations against China by acquiring more survivable platforms; investing in targeting, theater-range missiles, air defense, and submarines; reducing reliance on products from the PRC; and denying China war-critical products from the United States.[41] The Commandant of the Marine Corps, General David H. Berger, stresses

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[36] Nadia Schadlow, "Research and Debate—It's a Gray, Gray World," *Naval War College Review* 73, no. 3 (Summer 2020): 3.
[37] Oliver, "China's Maritime Militias," 41–42.
[38] Vrolyk, "Insurgency, Not War, Is China's Most Likely Course of Action."
[39] Hoffman, "Examining Complex Forms of Conflict," 35.
[40] *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018), 6–7. Although the list of factors in the publication consists of 8 total factors, it has been expanded to 13 for this analysis.
[41] Gompert, Cevallos, and Carafola, *War with China*, 70–71.

Figure 33. Factors for analysis

1	Nuclear weapons
2	Space capabilities
3	Cyberspace capabilities
4	Command, control, communications, computers, intelligence, surveillance, and reconaissance platforms
5	Air and missile defense
6	Aircraft
7	Ships/submarines
8	Ground–based fires
9	Training of personnel
10	Quantity of personnel
11	Unmanned and autonomous systems
12	Strategic lift
13	Allies/partners

Source: *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018), 6–7.

the need for the United States to field longer range rocket and missile systems.[42] As security analyst Paul van Hooft notes, other scholars recommend that the United States should develop stand-off weapons and increase shipbuilding with a focus on unmanned ships.[43] Similarly, Admiral James G. Stavridis, the 16th Supreme Allied Commander of NATO, as well as other experts, emphasizes how unmanned vehicles, submarines, satellites, and cyber tools are necessary for a war against China.[44] All of these suggestions fall within one or more of the capabilities derived from the *Summary of the 2018 National Defense Strategy of the United States*.[45] As such, the factors analyzed here incorporate recommendations provided by prominent authorities on the Chinese threat.

Applicability Comparison

An analysis of these 13 factors provides insight into the extent to which each one applies to gray zone and armed conflicts. Based on a scale ranging from one to five,

[42] Gen David H. Berger, "Preparing for the Future: Marine Corps Support to Joint Operations in Contested Littorals," *Military Review* (April 2021), 2.
[43] Paul van Hooft, "Don't Knock Yourself Out: How America Can Turn the Tables on China by Giving Up the Fight for Command of the Seas," *War on the Rocks*, 23 February 2021.
[44] James Stavridis, "If the US Went to War with China, Who Would Win?" *Nikkei Asia*, 30 May 2021.
[45] *Summary of the 2018 National Defense Strategy of the United States of America*, 6–7.

each element can have relevance to both forms of conflict with a higher score denoting greater relevancy. Grounded in the most common applications of how each element contributes to the two types of warfare, this analysis reflect the ways in which a factor may apply to armed conflicts as well as the gray zone. Not meant as a comprehensive exploration of each factor while looking at them through a purely military lens, the ranking system is meant to draw attention to the extent in which investment in certain areas could benefit the United States against China in both armed conflict and the gray zone. Based on the relevance of each factor to the different forms of conflict, each one also possesses a level of usefulness along the full range of the competition continuum. These positions can be broken into three categories: low (4–5-point spread), moderate (2–3-point spread), and, most importantly, high (0–1-point spread) usefulness (table 6). While most of the 13 factors fit into the moderate category, they all still have the potential to contribute to both armed conflict and the gray zone in specific ways.

The U.S. military could incorporate these 13 factors into potential strategic planning by comparing their roles in both armed combat and the gray zone. The use of nuclear weapons is the least applicable across the competition continuum. It would contribute significantly to an armed conflict through their devastating power that could easily produce at least 25 battle-related deaths.[46] While history shows that the likelihood of nuclear weapon employment is remote, the United States can decisively use nuclear weapons against China.[47] Yet, nuclear weapons are mostly irrelevant to gray zone actions due to their killing capability. In the gray zone, this option may serve as a deterrent by prompting China to question whether gray zone activity may escalate to an armed conflict that could result in the employment of nuclear weapons.

Moderately useful elements—eight in total—are most significant to armed conflict with less relevance to the gray zone. Ground-based fires, such as artillery, tanks, and multiple rocket launchers, afford the U.S. military with firepower in the land domain and, in conjunction with maneuver forces, is useful in countering China in armed conflict. In the gray zone, ground-based fires may serve to dissuade or deter Chinese aggression, but would have a limited application in these struggles.[48] Similarly, the quantity of personnel is more relevant in an armed conflict rather than in the gray zone. Because an armed conflict with China would inevitably cause casualties, it would be critical that the United States maintains a sufficient quantity of personnel to replace those casualties. As the purpose of gray zone actions is not to inflict casualties, the number of personnel is less relevant in this situation.

Aircraft, naval vessels, unmanned and autonomous systems, and strategic lifts would all support the personnel involved in the ground forces, which influences armed

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[46] Wallensteen and Sollenberg, "Armed Conflict," 643.
[47] Nina Tannenwald, "The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use," *International Organization* 53, no. 3 (Summer 1999): 433–69, https://doi.org/10.1162/002081899550959.
[48] Wallensteen and Sollenberg, "Armed Conflict," 643.

Table 6. A comparative analysis of the application of factors to armed conflict and the gray zone

The rating scale ranges from 1 to 5 based on its relevancy to the factor in each category				
Factor	Armed conflict	Gray zone	Spread	Usefulness across competition continuum
Nuclear weapons	Rating: 5	Rating: 1	4	Low
Ground-based fires	Rating: 5	Rating: 2	3	Moderate
Quantity of personnel	Rating: 5	Rating: 2	3	Moderate
Air and missile defense	Rating: 5	Rating: 2	3	Moderate
Strategic lift	Rating: 5	Rating: 2	3	Moderate
Space capabilities	Rating: 4	Rating: 2	2	Moderate
Aircraft	Rating: 5	Rating: 3	2	Moderate
Ships/submarines	Rating: 5	Rating: 3	2	Moderate
Unmanned and autonomous systems	Rating: 5	Rating: 3	2	Moderate
Command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR)	Rating: 5	Rating: 4	1	High
Cyberspace capabilities	Rating: 5	Rating: 5	0	High
Training of personnel	Rating: 5	Rating: 5	0	High
Allies/partners	Rating: 5	Rating: 5	0	High

Source: Maj Kendall J. Ignatz, USMC, adapted by MCUP.

conflicts more than the gray zone. Among other purposes, the United States can employ aircraft in armed combat for intelligence collection, precision strikes, bombing, close air support, electronic warfare, and military movements. Yet, the PRC's history of gray zone actions like violating Japanese airspace to provoke the Japanese could push the United States into responding with its own air force in similar situations.[49] Naval vessels enable the projection of forward combat power without the need to place forces on land. Ships can provide fires, project air power, and deliver logistics support while submarines can support ISR efforts as well as antiship and strike capability. Many of these same responsibilities can also assist the United States to create a show of force, establish a presence, and deter Chinese aggression and anticipate China's intents and capabilities in the gray zone.[50] Unmanned and autonomous systems

[49] Morris et al., *Gaining Competitive Advantage in the Gray Zone*, 96–97.
[50] van Hooft, "Don't Knock Yourself Out"; and Jeff W. Benson and Mark A. McDonnell, "Ships! Ships! All We Need Is Ships!," *War on the Rocks*, 1 June 2020.

both limits the risk of death by restricting the deployment of personnel in a warzone and potentially increases decision making and speed associated with activities while also eliminating human error during an armed conflict. Although less advantageous in the gray zone, unmanned and autonomous systems could aid the U.S. military in conducting intelligence, surveillance, and reconnaissance. Finally, strategic lifts in armed conflict, whether by air or sea, is crucial to the U.S. military's ability to rapidly respond to Chinese actions and project forces into theaters of operation. In the gray zone, however, these actions remain limited to shows of force or as military intimidation.[51]

Both air and missile defense and space capabilities are also highly applicable to armed conflict. China continues to develop advanced J-20 fighters and DF-26 ballistic missiles among other air and missile defense capabilities that the United States must potentially address in an armed conflict.[52] In such a struggle, the United States can employ satellites to aid in intelligence, communication, and navigation while also targeting and striking Chinese satellites to degrade the PRC's intelligence, communication, and navigation capabilities. In 2007, China shot one of its weather satellites with an antisatellite missile, which demonstrated the potential for kinetic military action in space.[53] When applied in the gray zone, air and missile defense would only provide limited deterrence, specifically as a restriction against a Chinese attack on or incursion of U.S. airspace. Previously, the space race between the United States and the Soviet Union during the Cold War illustrated how space applies to the gray zone. The United States can achieve global prestige and undermine China through advances in its space capabilities.

Most significantly, high usefulness factors—allies/partners, training of personnel, cyberspace capabilities, and C4ISR—contribute directly to both types of conflict and are most significant to potential confrontations with the PRC. Allies and partners are essential in armed conflict as World War II demonstrated. During that struggle, the United States and its allies combined their capabilities to effectively fight their adversaries.[54] Former U.S. Chairman of the Joint Chiefs of Staff, General Joseph F. Dunford Jr., explains the criticality of allies and partners, stressing that "coalition members increase available combat power" by taking up some of the weight of fighting and allowing the United States to be "more effective." Moreover, allies and partners enable forward positioning of forces and materiel and can share intelligence.[55] In the gray zone, allies and partners can provide the United States with forward positions for its forces and maintain a constant presence that could deter Chinese actions. Additionally, receipt of intelligence from allies and partners

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[51] Stavridis, "If the US Went to War with China, Who Would Win?"
[52] *In Their Own Words*, 22–34.
[53] Capt Alessio Di Mare, Italian AF, "The Role of Space Domain Awareness: Space Asset Resilience thru Protection," in *Joint Air & Space Power Conference 2021 Read Ahead: Delivering NATO Air & Space Power at the Speed of Relevance* (Kalkar, Germany: Joint Air Power Competence Centre, 2021), 228.
[54] Gen Joseph F. Dunford, "From the Chairman: Allies and Partners Are Our Strategic Center of Gravity," *Joint Force Quarterly* 87 (4th Quarter 2017): 4.
[55] Dunford, "Allies and Partners Are Our Strategic Center of Gravity," 5.

can offer the U.S. military with greater context regarding Chinese actions, both currently and in the future.[56]

As weapons and systems continue to advance and as the United States continues to develop its space and cyberspace capabilities, the need to train personnel increases to ensure that they are proficient with those new programs. With respect to technical education, data from 2012 shows that China, which consists of more than four times the population of the United States, has more than twice as many citizens with bachelor's degrees in science and engineering, while the United States enjoys less than a 10,000-person advantage in citizens holding doctoral degrees in science and engineering.[57] These numbers suggest that the Chinese military has a larger pool of educated citizens from which it can leverage to develop and operate technologically advanced weapons and systems. Due to China's employment of military intimidation and paramilitary activities in the gray zone, the U.S. military should concentrate training efforts on these aspects of the PRC's military activities and how to avoid escalation to armed conflict.[58]

With the rise of competition in cyberspace, the U.S. military must prepare for its role in both armed conflict and the gray zone. Colonel William D. Bryant, the deputy chief information security officer for the U.S. Air Force, highlights that the rise in cyber components in military systems creates a situation in which cyber operations can increase "fog and friction," surmising that "logistical systems will be easy targets" during these actions.[59] The 2021 Colonial Pipeline ransomware hack, which primarily affected civil infrastructure, illustrates the potential of cyber operations in the gray zone, highlighting how an actor can use cyberspace capabilities to disrupt an adversary.[60] In response, the United States must improve its cyberspace capabilities to counter any potential Chinese cyberattacks.

C4ISR is crucial to ensuring control over battlespaces. Control and communication of forces is essential in armed conflict, especially against a near-peer adversary like the PRC, which could contest U.S. C4ISR capabilities. ISR would enable the United States to plan operations against China as well as the identification and striking of Chinese targets. Whether conducting exercises, shows of force, or other nonkinetic operations against China in the gray zone, the United States must be able to control and communicate with its forces while intelligence, surveillance, and reconnaissance would allow it to anticipate China's intent and capabilities to avoid misinterpreting the PRC's actions, triggering armed conflict. In this type of conflict, the PRC could

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[56] Dunford, "Allies and Partners Are Our Strategic Center of Gravity," 5.
[57] Cordesman and Hwang, *Chinese Strategy and Military Forces in 2021*, 32.
[58] Morris et al., *Gaining Competitive Advantage in the Gray Zone*, 30–34.
[59] Col William D. Bryant, USAF, "Surfing the Chaos: Warfighting in a Contested Cyberspace Environment," *Joint Force Quarterly* 88 (1st Quarter 2018): 29.
[60] Stephanie Kelly and Jessica Resnick-ault, "One Password Allowed Hackers to Disrupt Colonial Pipeline, CEO Tells Senators," Reuters, 8 June 2012.

attempt to disrupt U.S. military operations by degrading C4ISR assets through cyberspace and electronic warfare, which increases the necessity of a resilient C4ISR system.[61]

Recent Chinese behavior provides a basis for the comparative analysis between these factors. Because the areas investigated are military in nature, they all have a generous degree of armed conflict application, meaning the current purpose is to explore their role in countering the PRC in the gray zone. The latest Chinese gray zone actions involving the Spratly Islands, the Kingdom of Bhutan, coercive acts in the South China Sea, and the Belt and Road Initiative (BRI) provide insight into how the PRC could behave in potential situations.

The PRC's dealings with the Spratly Islands, the Kingdom of Bhutan, the South China Sea, and the BRI highlight how it establishes a physical presence in or lays claim to areas. In the Spratly Islands, China began constructing artificial islands in 2013, promising not to militarize them. Despite this pledge, the PRC constructed airfields and other military infrastructure, which established both a regular presence a military capability in a territory under dispute.[62] The PRC also constructed three villages in the Kingdom of Bhutan, claiming they are part of Tibet. In the South China Sea, China combines its maritime militia and coast guard to prevent fishing vessels from neighboring states from fishing in what it claims is its territory.[63] The PRC's influence through its BRI elicits a concern that it "could be a Trojan horse for China-led regional development and military expansion." This program is a legitimate concern since "more than sixty countries—accounting for more than two-thirds of the world's population—have signed on to projects or indicated an interest in doing so."[64] These actions demonstrate that China's gray zone actions of constructing islands in disputed areas, building villages in neighboring territories, preventing fishing in the South China Sea, and exerting influence and reliance through the BRI has established a successful policy.

These cases raise a question concerning the ways that the United States could employ military capabilities against China in the gray zone since any conventional armed response would appear "disproportionate."[65] A soft power approach from the United States in response to an action like the construction of a village in Bhutan is unlikely to result in the PRC deconstructing the village or ceding it to Bhutan. Conversely, engaging China in armed conflict over the same issue would likely portray the United States as an unreasonable aggressor and China as a victim. To avoid future quandaries

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[61] Stacie L. Pettyjohn and Becca Wasser, "From Forever Wars to Great-Power Wars: Lessons Learned from Operation Inherent Resolve," *War on the Rocks*, 20 August 2021.
[62] James Holmes and Toshi Yoshihara, "The 5 Shades of China's Gray-Zone Strategy," *National Interest*, 16 June 2021.
[63] David Knoll, "Story Telling and Strategy: How Narrative Is Central to Gray Zone Warfare," Modern War Institute at West Point, 24 August 2021.
[64] Andrew Chatzky and James McBride, "China's Massive Belt and Road Initiative," Council on Foreign Relations, 28 January 2020.
[65] Knoll, "Story Telling and Strategy."

such as these, the United States should employ the military in the gray zone with the intent of identifying and preventing China from executing similar actions in the future.

For the United States to counter China in the gray zone, the U.S. military should focus mainly on improving its capabilities in cyberspace, C4ISR, training of personnel, and creating allies and partnerships. Doing so would allow the United States to apply all these elements to counter China in the gray zone. The United States could employ cyberspace assets to collect intelligence or to disrupt planning efforts related to future Chinese projects or gray zone initiatives. In cases where the PRC's gray zone actions may be more subtle or perceived positively, such as BRI projects, the United States could leverage its cyberspace assets to shape narratives via social media. It could also employ C4ISR assets to identify activity indicating the construction of islands, villages, and other infrastructure. C4ISR could also allow the United States and its partners and allies to identify the presence of Chinese maritime militia and coast guard vessels that may disrupt fishing fleets. The training of personnel would enable the United States and its allies to successfully apply modern capabilities and ensure that personnel refrain from acts that could escalate a conflict beyond the gray zone. Identifying the presence of maritime militia vessels, coast guard vessels, and gray zone construction activities requires servicemembers who could transform information obtained by C4ISR into reliable and useful intelligence. Finally, U.S. allies and partners could share intelligence concerning past, current, and future Chinese gray zone initiatives. All of these aspects permit the United States to identify, intervene, and ultimately prevent China's gray zone actions, disrupting its ability to exert influence.

While cyberspace, C4ISR, training of personnel, and allies and partners are useful for the U.S. military to counter China in the gray zone, these capabilities by themselves will rarely be decisive, but would contribute to a whole of government approach for the United States. For example, the intelligence provided by trained personnel and collected through cyberspace, C4ISR, and allies or partners will likely feed diplomatic negotiations, provide a basis to impose economic sanctions, or otherwise confront China. Regardless of what approach policymakers take, the military should remain secondary to and support the other components of the U.S. government while serving as a deterrent in the gray zone.

Comparing the applicability of these 13 military factors contextualizes how they would potentially align with either an armed conflict or in the gray zone during a future scenario between the United States and China. Of note, all these areas received equal or higher armed conflict applicability ratings when compared to their gray zone applicability. This observation suggests that preparing for armed conflict ensures that the U.S. military will also be prepared to counter China in the gray zone. When compared to investment in aspects associated with the gray zone, however, investment in armed conflict areas induce a greater financial burden. Therefore,

those factors determined to be most relevant to both armed conflict and the gray zone—cyberspace, C4ISR, training of personnel, and allies and partners—should receive investment priority.

Assessment

Analysis of the relevance of the 13 factors delivers two revelations. First, the fact that every area received an equal or higher rating when associated with armed conflict versus gray zone actions suggests a lack of areas unique to the gray zone. Second, it exposes that some factors apply predominantly to armed conflict while others are relevant to both armed conflict and the gray zone, which should influence how the DOD should prioritize its investment. Most notably, cyberspace, C4ISR, training of personnel, and allies and partners are areas that the United States could employ to great effect in both forms of conflict, meaning that the U.S. military should prioritize them for future investment. Having recognized each factor's degree of application, it is important to examine the impacts of increased or reduced investment in those areas.

Funding aspects associated with armed conflict generates a greater financial burden when compared to subsidizing areas with high relevance to the gray zone. The DOD budget proposal for fiscal year (FY) 2022 included investments across 9 major categories related to the 13 factors applicable to armed conflict and gray zone actions (table 7).[66] Based on the suggested investment of $315.3 billion related to those factors, the vast preponderance of the FY 2022 DOD budget proposal contained items associated with elements that received either low or moderate applicability ratings. For example, the $27.7 billion proposed for nuclear modernization—which included financing B-21 long range strike bombers, Columbia class ballistic missile submarines, long-range stand-off missiles, and ground based strategic deterrents—primarily applied to armed conflict.[67]

A small amount of the $315.3 billion pertained to both armed conflict and the gray zone. For instance, the proposed $10.4 billion for cyberspace activities aids the United States in countering the PRC in both forms of engagement. Although portions of the remaining budget proposal may have encompassed components applicable to both armed conflict and the gray zone, a comparison of the 13 factors listed here and the DOD funding request suggests that preparing for armed conflict imposes a substantially higher financial cost than planning for gray zone conflict.

Four recommendations emerge from this analysis. The intent of these recommendations is to minimize wasting financial resources while providing a way for the United States to contest the PRC in both armed conflict and the gray zone. To start,

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[66] *Defense Budget Overview*, 2-5. Although table 7 only encompasses categories that covers $315.3 billion of $752.9 billion in total, the other eight elements that totals $437.6 billion sit outside the scope of this project.

[67] *Defense Budget Overview*, 2-7.

Table 7. Fiscal year 2022 U.S. DOD budget proposal

Investment category	Amount	Primary use
Long-range fires	$6.6 billion	Armed conflict
Cyberspace activities	$10.4 billion	Both armed conflict and gray zone
Combat effective ground forces	$12.3 billion	Armed conflict
Missile defeat and defense	$20.4 billion	Armed conflict
Space and space-based systems	$20.6 billion	Both armed conflict and gray zone
Nuclear modernization	$27.7 billion	Armed conflict
Combat effective naval forces	$34.6 billion	Armed conflict
Lethal air forces	$52.4 billion	Armed conflict
Science and technology and advanced capability enablers (microelectronics, artificial intelligence, etc.)	$130.3 billion	Both armed conflict and gray zone
TOTAL	**$315.3 billion**	

Source: *Defense Budget Overview: United States Department of Defense Fiscal Year 2022 Budget Request* (Washington, DC: Office of the Undersecretary of Defense, 2021), 2-5.

effort and investments must prioritize the four most significant categories to gray zone actions—allies and partners, the training of personnel, cyberspace capabilities, and C4ISR. Investment in these four areas is worthwhile, especially when considering the low potential for wasting of resources. With considerable support for these elements, the United States could leverage them against China in both armed conflict and the gray zone.

Second, the U.S. military must continue to invest in preparations that have low and moderate application to both forms of conflict. These aspects are beneficial because they provide the United States with the means to deter China from engaging in a conventional armed conflict. When having to choose, however, investment in those areas should remain secondary to allies and partners, the training of personnel, cyberspace capabilities, and C4ISR.

Third, with the end of Operation Enduring Freedom in Afghanistan and hype concerning China's military advancements, there is a tendency to abandon training and education associated with counterinsurgency operations and nation-building and to myopically focus efforts on the conventional military threat that the PRC poses. Recognizing the potential for China to engage the U.S. military in proxy wars or to

incite insurgencies as part of its gray zone activities, the United States must retain the ability to mitigate those actions.[68] Therefore, it is imperative that military personnel train for both armed conflict and gray zone actions, with the understanding that the United States may engage in conflicts similar to those of the past.

Finally, should the U.S. military reduce its emphasis on nine factors that yield low or moderate relevancy to gray zone actions, it must develop methods that enable the rapid and efficient production of those areas when necessary. This recommendation is rooted in historical precedence. Between World War I and World War II, for instance, the U.S. Army formed *skeletonized* divisions, which maintained the structure of a unit with reduced manning in most cases to comply with existing budget constraints. Although maintaining reduced manpower, these units also established the structure needed to rapidly expand should a war begin.[69] Following a similar approach would permit the U.S. military to remain fiscally conscious while possessing the ability to surge production of certain resources as a threat from China gravitates toward either armed conflict or the gray zone. A contemporary method may include working with commercial companies to ensure that a capacity exists to quickly produce certain items, similar to how the U.S. government relied on companies to produce ventilators in 2020 during the initial waves of the COVID-19 pandemic.[70] Additionally, U.S. allies and partners could potentially provide surge capacity if needed.

Conclusion

While the original hypothesis behind this project suggested that increased investment in areas associated with armed conflict results in a reduced capacity to counter China in the gray zone, the evidence suggests that investments create a mostly complementary relationship regarding the effects of preparation for armed conflict and planning for gray zone conflict. For instance, investment in allies and partners, the training of personnel, cyberspace capabilities, and C4ISR aids in preparing to confront the PRC in both armed conflict and the gray zone. This realization means that the U.S. military does not have to prepare for armed conflict against China at the expense of priming itself for gray zone actions and vice versa.

While future research could address the same problem through diplomatic, informational, or economic lenses to provide a government-wide solution for how to compete with China across the competition continuum, the U.S. military must prepare to confront China in both the gray zone and armed conflict. On the one hand, fully equipping for armed conflict incurs high financial costs, but enables the

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[68] Vrolyk, "Insurgency, Not War, Is China's Most Likely Course of Action."
[69] William O. Odom, *After the Trenches: The Transformation of U.S. Army Doctrine, 1918–1939* (College Station: Texas A&M University Press, 1999), 82–83.
[70] Reed Albergotti and Faiz Siddiqui, "Ford and GM Are Undertaking a Warlike Effort to Produce Ventilators. It May Fall Short and Come Too Late," *Washington Post*, 4 April 2020.

U.S. military to remain ready to confront China in the two types of confrontation. On the other hand, if the U.S. military invests solely in those factors most relevant to the gray zone, the U.S. military will cede its ability to either deter or counter the PRC in armed conflict. Although necessary for the U.S. military to continue to invest in areas that support operations across the competition continuum, it must prioritize investment in the four prominent components—allies and partners, the training of personnel, cyberspace capabilities, and C4ISR—that allow it to mitigate both armed conflict against and gray zone threats from China. Through investment in universally applicable aspects and the development of methods to surge areas of nonuniversal applicability, the U.S. military can manage finite resources and enable itself to confront China across the competition continuum. To do so, the United States should consider reducing investment in areas associated primarily with armed conflict, but establish the means to surge production in those areas should they be needed.

Although China is seen as the foremost threat to the United States in both armed conflict and the gray zone, the United States must resist the temptation to allow only this situation to drive defense planning and funding. Even though China is the central actor here, these conclusions could be applied to help account for and plan to mitigate the actions of other possible adversaries, such as Russia, Iran, and North Korea.[71] The hope is that U.S. leaders outfit and prepare the military to counter China across the competition continuum but in a manner that avoids unnecessary spending. By prioritizing investment in areas applicable to both the gray zone and armed conflict and through the implementation of methods designed to surge capabilities or accelerate preparations specific to either one, the U.S. military can responsibly fund the branches and enable itself to confront China along the competition continuum.

[71] *Interim National Security Strategic Guidance* (Washington, DC: White House, 2021), 8.

Chapter 7

Unleash the Kraken

A Novel Marine Corps Formation for Littoral Warfare

Lieutenant Colonel Thomas E. Driscoll, USMC

The greatest threats to the sovereignty and global influence of the United States are nations, especially China and Russia, that seek parity with it in military technology and capability.[1] Although the realities of the Indo-Pacific region illustrate the clear naval character of the future, the national command authority (NCA) needs options for addressing threats militarily in other theaters around the globe. U.S. Marine Corps formations that support its national interests against Russian threats, while assuring European allies, provide vital contributions to the Joint force.

The Marine Corps has taken the initial steps for improving its support to the naval expeditionary force with the development of the expeditionary advanced base operations (EABO) concept and the Marine Littoral Regiment (MLR). While these ideas facilitate Marine Corps integration with the Navy for fires, intelligence, logistics, and command and control (C2) purposes, an analysis of EABO and MLR illuminates critical gaps in them. Emerging technologies and historical reviews establish the necessity for additional Marine Corps warfighting formations. Assessing recent Russian military activities and future technological developments suggest that the Marine Corps must develop a novel maritime combined arms formation to fight and win in the littorals.

To address the possibility of a conflict with a peer competitor, the Marine Corps should establish a new unit called the Littoral Maneuver Force (LMF). Lessons derived from Russia's invasions of Georgia in 2008 and Ukraine in 2014, coupled with emerging technology related to scouting and striking functions, support this recommendation, especially when testing it against a potential future scenario of a Russian invasion of Tallinn, Estonia. Examining the LMF as part of this theoretical engagement informs the possible organization of, equipment for, and critical tasks of the LMF. As a novel formation, the LMF, like the mythological Scandinavian Kraken, would be unleashed from the sea, inducing violence and destruction as punishment to adversaries ashore. Although having a strong potential for being a new formation, the creation of the LMF would have several operational and service implications.

[1] *Summary of the National Defense Strategy of the United States of America* (Washington, DC: Department of Defense, 2018).

The Charging Bear

Offensive actions against regional competitors fill the annals of Russian history, acts that illuminate its force employment objectives, methods, and structures. The NCA in Moscow demonstrates a political will that responds to provincial threats through military force, as illustrated in Georgia and Ukraine. A thorough understanding of Russian military capabilities can help Marine planners make decisions on force design.

Russia's invasion of Georgia in August 2008 showcased its ability in Joint multi-domain operations. Its operational approach synchronized large maneuver elements—consisting of ground, air, naval, and special operations forces—while achieving significant effects in the information domain. When commencing its two-front incursion, Moscow deployed 40,000 troops against a Georgian force of fewer than 15,000, demonstrating the Russian penchant for amassing tremendous combat power ratios.[2] Initially, the 58th Army attacked from the south through the Roki Tunnel on 7 August, deploying elements of one airborne division, two motorized rifle divisions, two assault divisions, three motorized rifle regiments or brigades, one assault regiment, one parachute regiment, and one special purpose regiment.[3] This main thrust continued through 11 August with Georgian forces eventually falling back in defense of the capital, Tbilisi.[4] Three days later, Russia opened up its second front in Abkhazia in northwestern Georgia, sending in one assault division, one mountain brigade, one assault brigade, three motorized rifle brigades, and three assault regiments, with Russian Marines landing at the port of Ochamchira.[5] Air force elements supported both axes to "restrict movement of enemy reserves, disrupt communications, incapacitate base airfields, destroy warehouses, and bases containing fuel and lubricants and to seal off the area of hostilities."[6] Additionally, Russia successfully employed and coordinated with irregular forces already operating in Georgia.[7] Prior to the invasion, Russia sent advanced forces to seize key terrain along both routes. The combined-arms forces of Russia proved too large, fast, and lethal for the Georgians. The units also consolidated their gains before regional or international forces could intervene.

For the first time in its history, Russian cyber operations achieved strategic effects in coordination with the actions on the ground. This massive cyberattack targeted numerous government websites and degraded strategic communications capabilities, which caused embarrassment and economic disruption.[8] Despite the ambiguous or-

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[2] Ronald D. Asmus, *A Little War that Shook the World: Georgia, Russia, and the Future of the West* (New York: Palgrave Macmillan, 2010), 165; and Ariel Cohen and Col Robert E. Hamilton, *The Russian Military and the Georgia War: Lessons and Implications* (Carlisle, PA: U.S. Army War College, 2011), 12.
[3] *Report of the Independent International Fact-Finding Mission on the Conflict in Georgia*, 3 vols. (Brussels, Belgium: Council of the European Union, 2009), 215.
[4] Asmus, *Little War that Shook the World*, 183.
[5] *Report of the Independent International Fact-Finding Mission on the Conflict in Georgia,* 211, 216.
[6] *Report of the Independent International Fact-Finding Mission on the Conflict in Georgia*, 215.
[7] Cohen and Hamilton, *Russian Military and the Georgia War*, 27.
[8] Asmus, *Little War that Shook the World*, 167.

igins of the cyberattacks, "the scale and level of sophistication required the professional planning and resources that only a state sponsor could provide."[9] The potential of similar offensive cyber capabilities in the future presents a salient issue for Marine countermeasures.

Despite its military successes in Georgia, Russia's operations displayed significant gaps across all warfighting functions and multiple leadership echelons.[10] In response, substantive military reforms followed that focused on increasing Russian military effectiveness on future battlefields. As U.S. Marines organize, train, and equip for the future, America's force-in-readiness needs to prepare for situations requiring the recapture of terrain and defeat of an integrated Russian force.

Russia's invasion of Ukraine in 2014 highlighted its advances in another area—special operations forces (SOF). After observing Western powers using special operations forces for more than a decade, the Kremlin sought to maintain deniability while affecting regional security dynamics. Surprise, confusion, and ambiguity was central to Russia's plan to invade Crimea. As a result, "Disguising an overt 'Russian hand,' therefore, was a military necessity from the beginning."[11] The events in Ukraine took place in two primary locations—the Crimean Peninsula and the Donbas region of Eastern Ukraine. The Crimean city of Sevastopol, home of Russia's Black Sea Fleet, provided a key naval base for the conflict. Under the guise of a snap exercise, 10 aircraft filled with Russian paratroopers arrived at Sevastopol International Airport on 26 February 2014. The following day, unidentified Russian units launched simultaneous assaults that resulted in the seizure of the military airfield at Sevastopol International Airport and the civilian airfield at Simferopol International Airport in Crimea.[12] Later in March, armed Russians, including one *spetsnaz* (airborne) unit, seized members of the Crimean parliament and bullied them into ratifying a "law unilaterally breaking with Ukraine."[13] Despite minor resistance from Ukrainian forces, Crimea passed into Russian control.

During the first week of April 2014, special operations forces in eastern Ukraine heightened tensions there. Operating in an unconventional warfare capacity along with "private but functionally extended state networks of . . . oligarchic groups, veteran organizations, nationalist movements, biker gangs, and organized criminal networks," these units "translat[ed] [the crisis] into protest marches, building occupations, secessionist

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[9] Asmus, *Little War that Shook the World*, 168.
[10] These challenges are discussed by both Cohen and Hamilton, *Russian Military and the Georgia War*; and Gerard Toal, *Near Abroad: Putin, the West and the Contest over Ukraine and the Caucasus* (New York: Oxford University Press, 2017), https://doi.org/10.1093/oso/9780190253301.001.0001.
[11] Toal, *Near Abroad*, 220.
[12] Lawrence Freedman, *Ukraine and the Art of Strategy* (New York: Oxford University Press, 2019), 86.
[13] Toal, *Near Abroad*, 222. For reference to the Russian *spetsnaz*, see Anton Lavrov, "Russian Again: The Military Operation for Crimea," in *Brothers Armed: Military Aspects of the Crisis in Ukraine*, ed. Colby Howard and Ruslan Pukhov (Minneapolis, MN: East View Press, 2014), 164.

rebellion, and subsequent war."[14] Along with these clandestine groups, Russia furnished equipment and capability support to eastern separatists that included "command and control systems, air defense systems with advanced surface to air missiles, unmanned aerial systems, advanced multiple rocket launcher systems, and electronic warfare systems."[15] In addition, Russia kept a force of approximately 40,000 regular troops, which demonstrated its readiness through exercises and discussion of a possible intervention, at the border with eastern Ukraine.[16] This combination of unconventional warfare with the SOF, advanced weaponry support, and threat of large-scale escalation ensured chaos in Ukraine during the conflict.

The Russian NCA also leveraged private military security companies (PMSC) in Ukraine. During the Crimean campaign, the private company Wagner Group assisted with the previously discussed referendum. In Donbas, Wagner specialized in "getting rid of local rebel commanders not to the Kremlin's liking . . . and in disciplining anti-Kiev rebel groups that operated too freely."[17] PMSCs added to the complexity of the operational environment in Ukraine, representing another component requiring preparation by future Marine formations.

Overall, Russian operations in Ukraine displayed its attempts at force employment without overt large-scale military deployments. SOF units annexed Crimea and created perpetual chaos in Donbas with segments acting as elite light infantry and others serving as covert entities supporting nonmilitary elements.[18] Russia's significant relative combat power advantage allowed a SOF-centric approach, which added a layer of complexity for Ukraine. While greater force parity between Russia and its adversaries could negate similar approaches, the SOF capabilities displayed in Ukraine exposes issues that NATO forces must prepare to confront in future regional conflicts.

Based on the examples of Russian military operations in Georgia and Ukraine, it is clear that while Russia is building its capacity to influence adversary actions through nonmilitary means, such as *reflexive control* and *cross-domain coercion*, its traditional units

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[14] Toal, *Near Abroad*, 239.
[15] Freedman, *Ukraine and the Art of Strategy*, 122.
[16] Freedman, *Ukraine and the Art of Strategy*, 91.
[17] Tor Bukkvoll and Ase G. Østensen, "The Emergence of Russian Private Military Companies: A New Tool of Clandestine Warfare," *Special Operations Journal* 6, no. 1 (March 2020): 11, https://doi.org/10.1080/23296151.2020.1740528.
[18] Tor Bukkvoll, "Russian Special Operations Forces in Crimea and Donbas," *Parameters* 46, no. 2 (Summer 2016): 13–21, https://doi.org/10.55540/0031-1723.2917.

possess increasingly formidable ground, air, sea, and information capabilities.[19] When the general-purpose components used in Georgia are added to the special operations elements employed in Ukraine, the resulting combined arms forces present several challenges.

In Georgia, the 58th Army acted as a combined arms army (CAA)—the main operational level command in conflict along the Russian periphery—and, as a formation, possessed significant firepower and mobility. Within the Army's motorized rifle divisions and motorized rifle brigade, a substantive combined arms formation, is the primary unit capable of independent operations, as it possesses 3,000–4,500 soldiers with counter-force capability.[20] When compared to contemporary U.S. Marine Corps units, the motorized rifle brigade possesses a noticeable advantage in mobility and firepower. Its significant number of tanks, infantry fighting vehicles with high-caliber heavy machine guns or cannons, cannon and rocket artillery, and antiarmor and antiaircraft weapons poses a potential problem for Marine ground formations. Furthermore, the motorized rifle brigades can be broken into multiple battalion tactical groups when the situation calls for a more decentralized organization.[21]

The CAA, along with the other major elements of the armed forces (air and air defense army, fleet, airborne forces command, and strategic rocket forces), are improving their ability to achieve combined arms effects.[22] The Georgia case study exemplifies Russia's quest for numerical superiority in manpower and ground-based fires in the land domain and future Marine elements must organize to defeat this growing threat. Conducting operations in complex terrain that negates armored mobility and increasing formations' organic fires capabilities offer options for future Marine actions against Russia.

Simultaneously, Russian SOF adds complexity to the battlefield. Whether acting as elite light infantry, covert intelligence collectors, or unconventional warfare operators, these troops increase the scope and scale of tasks Marine units must counter.

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[19] Gen Valery Gerasimov, Russian Army, "The Value of Science Is in the Foresight: New Challenges Demand Rethinking the Forms and Methods of Carrying Out Combat Operations," *Military Review* 96, no. 1 (January–February 2016): 23–29; Timothy L. Thomas, "Russia's Reflexive Control Theory and the Military," *Journal of Slavic Military Studies* 17, no. 2 (June 2004): 237–56, https://doi.org/10.1080/13518040490450529; and Dmitry Adamsky, "From Moscow with Coercion: Russian Deterrence Theory and Strategic Culture," *Journal of Strategic Studies* 41, nos. 1–2 (February 2018): 33–60, https://doi.org/10.1080/01402390.2017.1347872. Thomas defines *reflexive control* as "a means of conveying to a partner or opponent specifically prepared information" to push them to "voluntarily make the predetermined decision" that the "initiator of the action" desires. See, Thomas, "Russia's Reflexive Control Theory and the Military," 237. Adamsky defines *cross-domain coercion* as "efforts to deter . . . and to compel . . . by orchestrating soft and hard forms of influence across the nuclear, conventional, and informational (cyber) domains through all stages of strategic interaction (peace, crisis, and war)." Adamsky, "From Moscow with Coercion," 36.

[20] Lester W. Grau and Charles K. Bartles, *The Russian Way of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces* (Fort Leavenworth, KS: Army University Press, 2007), 30.

[21] Grau and Bartles, *Russian Way of War*, 36–37.

[22] Bettina Renz, *Russia's Military Revival* (Cambridge, UK: Polity Press, 2018).

These forces can target strategic or operational assets through direct action, gather information while appearing as civilians, and achieve disproportionate effects through employing highly technical weaponry from concealed locations—all capabilities that may occur in the maritime and land domains.[23] Based on the types of activities Russian SOF conducted in Ukraine, the U.S. military should expect to encounter Russian PMSCs performing SOF-like actions throughout the battlespace. Only skilled tactical units, maneuvering on land and at sea while also identifying and targeting these types of SOF operations, can disrupt and degrade them before the actions achieve noteworthy effects. While these special operations and private forces represent a significant hazard by themselves, the resulting Russian capabilities when these are combined with capable general purpose forces demand the formation of a new kind of Marine unit.

Finally, Russia's employment of cyber warfare in both instances highlight the importance of defensive cyber capabilities for major combined arms formations. While offensive cyberattacks occur at higher levels by both adversaries, protected tactical level networks ensure the integration and coordination required for future Marine detachments conducting combined arms operations.

Search and Destroy: The Scout-Strike Alternative Future

In addition to Russian actions demonstrated in recent military operations, future conflicts are informed by systemic changes in warfare, which supplements historical analysis and further informs understanding about the future. Emerging technologies, such as artificial intelligence, lethal autonomous weapons, hypersonic weapons, directed energy, biotechnology, and quantum technology, threaten to fundamentally alter scouting and striking functions.[24] Scouting refers to the act of finding an adversary on the battlefield, whereas striking is the act of attacking that adversary. Russia's pursuit of emerging technologies along the scout and strike vectors amplifies the future threat it poses.[25] The alternative futures analysis, an applied critical thinking technique, illuminates potential characteristics of a future operating environment influenced by technologies.[26] Scout and strike capabilities serve as the two most critical forces. The analytical tool places each force on an axis defined by the most relevant endpoints and forms a futures matrix by crossing them.[27] While the futures matrix produces four results, one of them informs the current discussion: The conditions of maximum scouting capabilities, such as when belligerents identify their adversaries rapidly as they appear on the battlefield, combined with maximum striking capability, when bellig-

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[23] Magnus Nordenman, *Maritime Defense of the Baltic States* (Washington, DC: Atlantic Council, 2017), 4.
[24] Kelley M. Sayler, *Emerging Military Technologies: Background and Issues for Congress* (Washington, DC: Congressional Research Service, 2022), 5–6, 10–11.
[25] Sayler, *Emerging Military Technologies*, 13–14.
[26] *Red Team Handbook: The Army's Guide to Making Better Decisions*, Training Document G-2 (Fort Leavenworth, KS: U.S. Army Combined Arms Center, 2018).
[27] *Red Team Handbook*, 88.

erents attack adversaries with significant lethality. The analysis uncovers several key findings: sensors identify small-size targets; the targeting cycle—described as decide, detect, deliver, assess—compresses; identifying targets and cueing strike platforms occur in an integrated fashion across multiple domains; and the ratio of probability of hit to probability of kill approaches one, describing the increased lethality of weapon systems. Technological developments decrease costs of platform design, enabling the application of sophisticated weapons down to tactical level targets. These combined characteristics describe an operational environment where intensely destructive effects achieve a scale, scope, and pace previously unseen.

The systemic adaptations in scouting and striking functions drive additional military evolution. First, the capacity to reduce the effect of delivered firepower, known as counterforce, increases.[28] Military formations integrate missile defense as well as counterunmanned air systems capabilities. Second, military forces maneuver in complex terrain, including urban environments, to minimize their target signatures and diminish enemy fire effects. Additionally, the interaction between the urban terrain's tactical effects, the presence of civilian populations, and higher-level political consequences enhance the popularity of cities. Increasingly, militaries seek an optimal balance between operations in complex terrain that keep units below target signature thresholds and formations possessing significant counterforce capabilities.

As the aforementioned advances increase engagement ranges, they also drive a reevaluation of the existing seams between forces. Based on current capabilities, the Navy and Marine Corps team normally conduct naval expeditions with a seam near the water's edge. Navy-sourced fires and maneuver assets initiate strikes against opposition ground forces ashore and then Marine units debark from air or surface craft to continue the fight. This paradigm must change. One potential solution to this shift is pushing the seam between Navy and Marine forces further out to sea. Along with refined littoral capabilities, any systemic adaptations should drive the need for Marine formations that can win in the urban environment, identify adversaries attempting to hide among the civilian populace, and protect the force through robust missile defense systems.

The Future Conflict

Although the potential causal factors for conflict between Russia and the United States is beyond the scope of this chapter, it is possible, and necessary, to discuss the characteristics of prospective locations for a fight between Russian and U.S. Marine forces. The Baltic Sea region (BSR), the most likely flashpoint for the two nations, presents numerous time, space, and purpose challenges as an operational theater. Bordered by

[28] Wayne Hughes, *Fleet Tactics and Naval Operations*, 3d ed. (Annapolis, MD: Naval Institute Press, 2018), 168.

nine countries, the Baltic Sea is approximately 193 kilometers wide, creating a compacted maritime and air maneuver area. Shallow water characterizes a large portion of the hydrography, limiting seaborne movements in certain areas to surface vessels with minimal draft. With 15 percent of the world's maritime cargo and large fishing fleets constantly transiting through the sea, shipping lanes are frequently congested.[29] The enduring civilian presence in the maritime environment also offers potential concealment for military units and complicates the decision calculus regarding the use of force. Gas and energy infrastructure abound, requiring protection as well. While these are only some of the BSR's features, they portray a dense and complicated operational environment.

Despite having gained independence from Russia as the Cold War ended, the three Baltic states—Estonia, Latvia, and Lithuania—still remain outflanked by Russia due to its western-most province, the Kaliningrad oblast, sitting along the Baltic. Most significantly, Russian antiship and land attack capabilities, specifically the Iskander-M and Kalibr (3M14) missiles, in Kaliningrad cover the entire region surrounding the Baltic states in a layered fashion.[30] These large systems form the umbrella of antiaccess and area-denial capabilities that Western forces will have to overcome in the event of military operations.

In preparation for any future struggle with Russia, the U.S. military should explore potential scenarios that highlight the Russian approach to war in the BSR. A future Russian conflict with one of these states—perhaps after an invasion of Estonia in 2035 as laid out below—would doubtless incorporate techniques previously employed in Georgia and Ukraine.

Several months prior to invading, Russian SOF would infiltrate Estonia and begin shaping the operational environment. These elements would conduct special reconnaissance on Estonian and NATO military units, critical infrastructure, and potential targets for sabotage while unconventional warfare units locate ethnic Russian anti-Estonia groups. These factions could then transition into local militia units and establish supply depots near the capital of Tallinn as well as Tartu, a key city in southeastern Estonia. Additionally, the PMSC Moran Security Group would commence operations at the Port of Tallinn to coordinate with Russian SOF in establishing supply depots, develop targets to disrupt civilian businesses, and prepare to mine key maritime areas in anticipation of an U.S. and NATO response.[31] Just before the invasion would commence, Russian SOF, in collaboration with cyber operatives, sabotage the Estonian power grid, financial networks, and the NATO network. Favorable physical and informational environmental conditions should now exist for Russian offensive operations.

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[29] Nordeman, *Maritime Defense of the Baltic States*, 2.
[30] Robert Dalsjö, Christopher Berglund, and Michael Jonsson, *Bursting the Bubble: Russian A2/AD in the Baltic Sea Region: Capabilities, Countermeasures, and Implications* (Stockholm: Swedish Defence Research Agency, 2019), 39–41.
[31] Bukkvoll and Ostensen, "Emergence of Russian Private Military Companies," 14. Moran Security Group maintains its own fleet of unmarked vessels.

On D-day, the 20th Combined Arms Army would attack along two fronts. In the preceding days, the army would move from southern Moscow to northwest Russia under the cover of a snap exercise—a no-notice deployment drill testing the unit's readiness. The 144th Motor Rifle Division would attack west on Highway 20 from Narva toward Tallinn along the North Estonia coastal plateau.[32] At the same time, the 3d Motor Rifle Division would strike north on Highway 263 from Pskov toward Tartu, smashing through Estonian defenses. Along Highway 20, the 144th Motor Rifle Division could rapidly neutralize the British-led NATO enhanced forward presence reinforced armored infantry battalion deploying from Tapa, Estonia.[33] The 6th Combined Arms Army, specifically the 25th and 138th Motor Rifle Brigades, would remain near St. Petersburg as the theater reserve. Due to the significant size, firepower, and mobility advantages, the motor rifle divisions could quickly penetrate deep into the country.

In support of the Russian ground forces, the 6th Air and Air Defense Army would surge fighter sorties. These Russian air forces could hastily overwhelm the steady-state Baltic air policing mission, highlighting the challenge of rapid transition to the sortie generation rates required for high intensity combat. The 6th Air Army could gain air superiority through its actions as well as its land- and sea-based air defense assets. The Baltic Sea Fleet would deploy its frigates and destroyers, establishing air and missile defense over Estonia while corvettes would be put to sea and produce antisurface protection for the Russian fleet. The 11th Army Corps would maintain its position at Kaliningrad on alert with the 336th Naval Infantry Brigade prepared to conduct amphibious landings to support the 20th CAA's ground advance.

As the dust settles from the invasion, the 144th Motor Infantry Division, with supporting assets, would entrench within Tallinn's urban environment. Simultaneously, the 3d Motor Infantry Division would control Tartu in the southeast. From then on, the Russian national command authority would remain committed to retaining the newly acquired Baltic terrain. Currently, the United States would not have a response to the Russian attack in this hypothetical situation.

The Littoral Maneuver Force

This theoretical scenario sets the scene for the employment of a new Marine formation. To defeat Russian forces in an urban littoral terrain like Tallinn, this new unit should possess specific capabilities. It would need to have tactical maneuverability in the littoral maritime domain, fires to support the seizure of urban terrain, reconnaissance assets to identify Russian SOF for targeting, collection means for

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[32] Konrad Muzyka, *Russian Forces in the Western Military District* (Arlington, VA: CNA, 2021). The discussion of Russian military units comes from the dispositions outlined in this paper.
[33] "NATO's Enhanced Forward Presence," NATO, March 2021.

both enemy- and friendly oriented information to counter disinformation campaigns, counter-electronic warfare, defensive cyber operations, and protection from air and surface threats. The Littoral Maneuver Force could incorporate all these capabilities.

The LMF is a regimental-size organization consisting of three primary subordinate elements. Two of these units are ground maneuver battalions that have similar structures to the recent redesigned infantry battalion.[34] The novel subordinate element is the Fire Boat Flotilla (FBF). This boat-based maritime formation allots the LMF with littoral maneuver capabilities, close-in fire support, and missile defense for the ground maneuver battalions, drastically minimizing the seam between the maritime and urban terrain. The foundational unit for the FBF, the boat squad, would operate from a single vessel and could provide direct and indirect fire support to an infantry platoon in the ground maneuver battalion. Generally, three boat squads and a headquarters boat would comprise a boat platoon. Three boat platoons plus two headquarters boats would make up a boat squadron. The entire flotilla consists of two, 14-boat squadrons, plus a 10-boat headquarters element. The LMF's organization would position Marines with the appropriate skills and authorities to ensure a mission's success.

The regimental headquarters organization rounds out the formation. An organic reconnaissance company would expand the intelligence capability of the LMF and could contribute high caliber counter-SOF capabilities. A robust intelligence center would also generate and receive actionable intelligence to support operations. Naval personnel and systems in air, surface, and subsurface operations would give the headquarters both offensive capabilities and enduring force protection. A defensive cyber cell would ensure uninterrupted operations for the tactical networks on which combined arms rely. The robust capabilities at the regimental headquarters would assist with integrating the formation's substantive tactical effects with other maritime and land units as well.

Equipping the LMF begins with its primary asset, the Mark VI patrol boat, an 85-foot craft currently under U.S. Navy contract by SAFE Boats International. This vessel mounts multiple weapons platforms, patrols in shallow waters, and has berthing and messing accommodations to facilitate long duration missions. Additionally, it can carry and launch a small boat that could allow for deploying a detachment for supporting operations. The patrol boats offer several offensive and counter-force systems in support of the LMF's missions.[35] The Mark VI's primary weapon is a Hellfire equivalent ground missile launcher. This system delivers significant lethal support to ground maneuver battalions as they encounter urban strongpoints or, possibly, armored vehicles concealed in the urban terrain. The boats also possess an

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[34] *Tentative Manual for Expeditionary Advanced Base Operations* (Washington, DC: Headquarters Marine Corps 2021), A-7–A-8.
[35] "Safe Mk VI Patrol Boat (Mk VI PB)," Safe Boats, accessed 21 April 2022.

81mm mortar systems employing the Advanced Capability Extended Range Mortar (ACERM).[36] This weapon, launched from the sea, supports infantry units ashore with its loitering capability, which alleviates the need for a stabilized launching platform and its responsive close-in indirect fires support the seizure of terrain. In addition, each Mark VI maintains a 7.62mm coaxial machine gun with a fire control system similar to the one on an Abrams tank. This capability produces highly accurate fire, with minimal potential for collateral damage, against both land and maritime targets. Lastly, the Mark VI launches and controls swarming small unmanned aircraft systems (UAS), such as the Kratos UAS Wolf-pack.[37] While providing offensive support to ground maneuver battalions, the FBF protects its boats and ground maneuver battalions with counterforce capabilities. The Mark VI maintain antiair and antisurface missile systems and can operate either in a point defense role or in an integrated manner as a boat platoon, squadron, or flotilla. With this equipment, the FBF could dominate the littorals as a formidable addition to the Marine Corps combined arms team.

Land-based equipment would complement the LMF's maritime capabilities, increasing the ground maneuver battalions' lethality in the urban environment. Several robots enhance the unit's fire power, especially its capstone item—the OntosPlus. Named after its forbearer—the Vietnam War-era tracked vehicle with six 106mm recoilless rifles—the OntosPlus is a tracked robot that launches an FGM-148 Javelin missile. Additionally, another ground robot could supply the infantry battalion with an 81mm ACERM, which would allow infantry closure on objectives under the suppression of responsive high-angle fire or would deliver suppressive fires to the flank of a movement corridor. The ground-based fires organic to the LMF assist in the ultimate objective, seizure and retention of critical urban littoral terrain, especially when the FBF is unavailable for fire support.

The LMF's organization and equipment could ensure an attainable mission essential task list. The main function the unit could execute for the Marine and Joint force commanders is the seizure and retention of urban littoral terrain. Along with its maritime and land maneuver options, the LMF could provide fires in support of ground assaults. The unit's littoral patrolling and maritime intercept capability would present a task at a scope and scale unparalleled in Marine Corps history. With the FBF deploying boat squads throughout an amphibious operating area, Marines could conduct sea denial through the interdiction of adversary maritime assets, especially those concealed in vessels appearing as commercial traffic. Maximizing the highly proficient reconnaissance company, the LMF could execute precision raids on high value targets while the flotilla's multiple craft would act as platforms for robust air and surface missile defense. Finally, the LMF could perform reconnaissance and defensive

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[36] David Hambling, "The Marines Trusty Mortar Is Getting a Major Upgrade," *Popular Mechanics*, 2 June 2016.
[37] "Small UAS Swarming," Kratos, accessed 21 April 2022.

cyber operations. These tasks would further support naval scouting operations as well as defense of an amphibious task force. The LMF's responsibilities could definitively enhance U.S. and NATO responses in the BSR.

The LMF would significantly enhance the Joint forces' capability to respond to Russian aggression in the hypothetical Estonia scenario. Based on the manpower requirements of conflict in an urban terrain and the divisional size of the adversary, the LMF would most likely operate alongside U.S. Army detachments, NATO ground units, or both, assigned to the littoral sector of the area of operations. To mitigate the systemic innovations in scouting capabilities and striking lethality, Russian armored and mechanized vehicles may be forced to conceal themselves within an urban environment. While the Russian CAA, supported by the Air and Air Defense Army, relies on its numerical superiority in personnel and armored vehicles to gain advantages like those observed in Georgia, Russian operations could be decisively influenced from the sea. As the U.S. Navy would neutralize the Baltic Sea Fleet, the LMF's littoral-based attack vectors could create an asymmetric advantage for the Marine Corps and Joint force. Russian emphasis on the land domain leave it highly susceptible to the assaults originating from the sea because it would not possess a comparable formation, which could permit the LMF to achieve highly disruptive and destructive cross-domain effects. While Russian SOF and PMSC would seek to hide among civilians and achieve destructive maritime effects, the LMF's littoral patrolling and maritime intercept operations would protect larger naval vessels. The FBF would provide theater ballistic missile defense and prevent maritime SOF and PMSCs from attacking U.S. cruisers and destroyers, which could be highly susceptible to assaults from small craft. The FBF would also prevent unconventional Russian capabilities from effectively supporting the CAA. The LMF's reconnaissance company would further degrade the SOF capacities observed in Ukraine through precision raids. The combined land and maritime force of the LMF could effectively separate Russian lines of communication from their connections to the sea, isolating the motorized rifle division. The LMF would dominate the theater's littorals, significantly degrading CAA elements in this area and enabling the coalition force's defeat of Russian forces in Estonia.

The current force design efforts of the Marine Corps focus on expeditionary advanced base operations (EABO), a capability provides fire bases, information collection or relay stations, and/or logistics nodes for the naval expeditionary force. The Marine Littoral Regiment (MLR) conducts EABO.[38] The LMF could present additional naval expeditionary capabilities to the MLR for a naval campaign. Most notably, the LMF would do what the MLR does not—seize and retain terrain.[39] Furthermore, the LMF's prospective maritime intercept capabilities, which do not exist in the MLR,

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[38] *Tentative Manual for Expeditionary Advanced Base Operations*, 1-3–1-4.

could enable effective naval expeditionary force operations in environments characterized by large amounts of civilian maritime traffic, especially areas the experience unconventional warfare activities and hold PMSCs. While MLR's could provide strike capabilities to the naval and Joint force, the LMF could uncover adversaries hiding among civilians, which would increase the units value through an additional layer of targeting compared to the MLR. Lastly, by providing a task-organized combined arms force specifically designed for the littoral environment, the Marine Corps, through the LMF, would diminish a traditional seam in the operational environment and afford more relevant tactical capabilities to the Joint force than the MLR.

In addition to supporting the defeat of Russian aggression, several implications flow from the development of the LMF. While the unit could be useful in other areas of Europe, such as coastal Norway, there are large possibilities for its use in the Western Pacific. Archipelagos like the Philippines and Indonesia are examples of potential operational environments where the tactical littoral maneuver, offensive firepower, and force protection of the LMF could be instrumental to naval campaign design. Also, the FBF shares many capabilities traditionally associated with coastal navies. As Wayne Hughes notes, "Coastal navies use land installations to scout and attack from as safer, cheaper, and more resilient than large warships. Their fighting ships are small and heavily armed. They depend for success on stealthy attack and surprise by out-scouting the enemy. Their ships are short-legged with austere habitability, because they can sortie to perform brief, stressful tasks."[40]

By possessing these coastal navy traits, the LMF would provide the Marine Corps partnering opportunities with small navies around the globe. Whether building relationships and capabilities in peacetime or conducting combined operations during conflict, littoral partnerships grants a substantive component to counter future aggression by great power competitors. Although this chapter focuses on the regimental-size LMF, its maritime character and significant departure from current structures may imply a substantive change to the composition of Marine Divisions. Further research should look at major changes to Marine divisions' mission essential task list, as well as a table of organization and equipment, that further enhance Marines' ability to dominate littoral warfare in support of theater objectives. Additionally, since the LMF transitions several littoral capabilities from the Navy to the Marine Corps, further analysis can inform the logical Service placement of other capabilities, such as Naval Expeditionary Combat Command. Most importantly, however, although missile-based naval systems can influence land objectives, the LMF's potential to seize and retain

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[40] *Tentative Manual for Expeditionary Advanced Base Operations*, A-1. The MLR's mission-essential task list is conduct surveillance and reconnaissance, conduct operations in the information environment (OIE), conduct screen/guard/cover, deny or control key maritime terrain, conduct surface warfare operations, conduct air and missile defense, conduct strike operations, conduct sustainment operations, and conduct forward arming and refueling point operations.

[40] Hughes, *Fleet Tactics*, 159.

terrain allows the naval expeditionary force to achieve campaign objectives without requiring an U.S. Army landing force.

Conclusion

Within a naval campaign, land-based objectives can be used to support subsequent maritime operations. Yet, these objectives also serve as the ultimate aim of campaigns. Julian S. Corbett wrote, "[One existing fallacy is] the idea that war consists entirely of battles between armies and fleets. It ignores the fundamental fact that battles are only the means of enabling you to do that which really brings wars to an end—that is, to exert pressure on the citizens and their collective life."[41] While controlling sea lines of communication contributes to economic pressure on a population, proficiency in capturing territory remains a critical component. Self-contained maritime combined arms formations, such as the LMF, blur the seam between land and sea domains as they provide an asymmetric advantage against adversaries like Russia and China. Russia continues developing organizations, equipment, and manpower to confront western forces in rapid and highly destructive conflicts. The continual adaptation of the Marine Corps keeps the Service as a source of strength on which the nation can lean in times of uncertainty. The LMF demonstrates the latest adaptation in the Corps that presents essential skills to the Joint force, as well as tactical and operational dilemmas to the nation's adversaries.

[41] Julian S. Corbett, *Some Principles of Maritime Strategy* (New York: Longmans, Green, 1911), 43.

Chapter 8

Cold Feet

A Posture for the Marine Corps of 2030 on NATO's Northern Flank

Major Alexander T. Luedtke, USMC

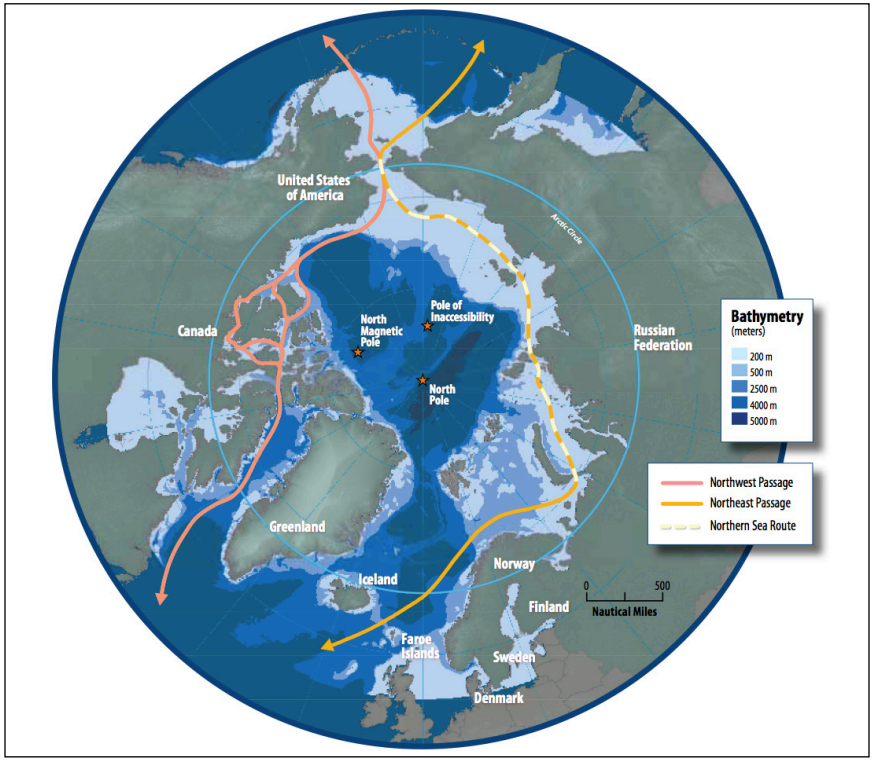
For three decades, the Marine Corps has contributed to collective efforts to strengthen deterrence and support allies in the area referred to as the northern flank of the North Atlantic Treaty Organization (NATO). This region consists of the littoral segments of Norway, both landward and seaward, running from Trondheim to the border with Russia, including all the major sea lanes (figure 34).[1] While the northern flank is within the area of responsibility for the U.S. European Command (USEUCOM), it is also considered part of the broader Arctic. The unique geopolitical position of the northern flank has made it a focus of military interest and activity since the end of World War II.

The Marine Corps promotes the region's security by reinforcing the defense of Norway, manifesting in five ways: security cooperation, cold weather training, expeditionary operations, sustained land operations, and prepositioning of materiel. The ability of Norway and NATO to defend the Arctic region is demonstrated in a large-scale, multinational, Joint exercise, such as Trident Juncture 2018, Cold Response 2020, and Cold Response 2022. The Marine Corps, USEUCOM, and NATO assert that these exercises assure allies and deter Russia from using force to change the Arctic status quo or violate Norwegian sovereignty.

The changing character of war, recent Russian activity, and the consequences of the publication *Force Design 2030* challenges the view that the Marine Corps role in the collective defense of NATO's northern flank is sufficient to deter Russia. NATO's most recent analysis concludes that Russian aggression against Georgia and Ukraine, ongoing military buildups, incursions in regional airspace, and attempts to curb the freedom of navigation in the Atlantic indicate that the current posture for deterring Russia is insufficient.[2] Some predict that "the United States will not only lose its ability to access portions of the Arctic by 2050, but Russian advances in its anti-access/area denial [A2/AD] capabilities in the Arctic will make U.S. costs of entry much higher. . . . the United States remains increas-

[1] Rowan Allport, *Fire and Ice: A New Maritime Strategy for NATO's Northern Flank* (London: Human Security Centre, 2018), 8n.
[2] *NATO 2030: United for a New Era: Analysis and Recommendations of the Reflection Group Appointed by the NATO Secretary General* (Brussels, Belgium: North Atlantic Treaty Organization, 2021), 25–26.

Figure 34. Arctic Sea routes



Source: *Arctic Marine Shipping Assessment, 2009 Report* (Tromsø, Norway: Arctic Council's Protection of the Arctic Marine Environment, 2014), 17.

ingly vulnerable to growing Russian missile capabilities based in the Arctic—both conventional and nuclear."[3]

In addition to changes in Russian military arrangements in the Arctic, the retreat of polar ice, opening of the Northern Sea Route, increased economic development there, and the "unthawing" of territorial disputes is resulting in calls for a reordering of national defense priorities.[4] These appeals compete with the Marine Corps effort to modernize its forces to contend with China, as the Service is seeking to both

[3] Heather A. Conley et al., *America's Arctic Moment: Great Power Competition in the Arctic to 2050* (Washington, DC: Center for Strategic and International Studies, 2021), 3.

[4] Russia and Norway have released updated Arctic strategies in the last five years. The DOD and the U.S. armed Services have released seven Arctic-centric strategies in the last two years. Janis Kluge and Michael Paul, "Russia's Arctic Strategy through 2035: Grand Plans and Pragmatic Constraints," *SWP Comment* no. 57 (November 2020); *The Norwegian Government's Arctic Policy: People, Opportunities and Norwegian Interests in the Arctic* (Oslo: Norwegian Ministry of Foreign Affairs, 2020); and *Report to Congress Department of Defense Arctic Strategy* (Washington, DC: Office of the Under Secretary of Defense for Policy, 2019).

"optimize the Marine Corps to be the Stand-in force" as a "conventional deterrence against a pacing threat" and maintain its "global crisis response force capabilities."[5]

Amid these trends, the Marine Corps' posture on NATO's northern flank remains unchanged since the Cold War. The current disposition, which supported the ability to reinforce the land defense of Norway, gradually degraded from a high state of readiness in the 1980s to resource other emergent priorities. In recognition of the need to change, Commandant General David H. Berger notes that while the last several years have been focused on "relearning effective expeditionary operations in the unique conditions of the region," he envisions improvements in Marine Corps capability that will form the contact layer in day-to-day strategic competition with Russia.[6] This new strategy aligns with the operation guidance found in *Force Design 2030*, moving away from legacy Cold War contingency requirements.[7]

Modifying the current posture to defend the littorals of Norway opens a way for the Marine Corps to buttress collective efforts on the northern flank. To make this case, this chapter reviews the origins of the current posture and evaluates its impact on Soviet and Russian behavior in the region after World War II. A proposed future scenario that demonstrates how a *Force Design 2030* force would deter the Russian Federation illustrates the importance of adjusting the role of the Marine Corps on the northern flank.

Origins of the Current Posture

The primary driver to committing forces to the northern flank was how the Soviet Union and Russia perceived the region's value.[8] As early as 1949, the U.S. Joint Chiefs of Staff developed a "plan for world war with the Soviet Union" called Dropshot. Considered "the main military planning product of the times," Dropshot deliberated the place of the northern flank within this larger struggle.[9] It envisioned one part of a Soviet campaign that advanced through the northwestern border to "gain control of Norway and Sweden for security, denial, or offensive purposes."[10] Dropshot described the strategic value of the northern flank in its "Hold Norway and Sweden" course of action, which noted its centrality to maintaining air and sea superiority in the region.[11]

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[5] Gen David H. Berger, *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2021), 12.
[6] "Marine Corps Wants Anti-Submarine Role," Australian Naval Institute, 8 November 2020.
[7] Berger, *Force Design 2030*.
[8] Gjert Lage Dyndal, "How the High North became Central in NATO Strategy: Revelations from the NATO Archives," *Journal of Strategic Studies* 34, no. 4 (August 2011): 557–85, https://doi.org/10.1080/01402390.2011.561094; and Gjert Lage Dyndal, "The Northern Flank and High North Scenarios of the Cold War" (conference presentation, Zentrum für Militärgeschichte und Sozialwissenschaften der Bundeswehr, Potsdam, Germany, 24 October 2013).
[9] Anthony Cave Brown, "Editor's Prologue," in *Dropshot: The American Plan for War with the Soviet Union in 1957*, ed. Anthony Cave Brown (New York: Dial Press, 1978), 1.
[10] "Initial Courses of Action," in *Dropshot*, ed. Brown, vol. 2, *Holding the Last Line of Defense, Preparing for the Counter-Offensive* (New York: Dial Press, 1978), 136.
[11] "Northern Europe: Hold Norway and Sweden," in *Holding the Last Line of Defense*, 150.

To ensure the security of the northern flank, Dropshot set requirements for offensive and defensive naval forces there. In the plan, the United States stationed Marines in Iceland while allocating the preponderance of naval surface and subsurface assets to the Barents-Norwegian Sea region.[12] Despite this proposal, the United States did not commit the forces as intended. This initial postponing of forces evolved as different conditions influenced the forecasts and designs of U.S. and NATO planners (table 8). In a 1984 U.S. Naval Institute *Proceedings* article, Colonel Joseph H. Alexander illustrated the evolving circumstances when he co-opted Dropshot's logic to justify a Marine Corps investment in an ashore prepositioning program and a dedicated rapid deployment force (RDF) to reinforce the land defense of Norway to secure NATO's northern flank:

> Norway's proximity to the access routes and home waters of the Soviet Navy's Northern Fleet accounts for the nation's greatest strategic significance. . . . A strongly defended Norway would enable the NATO alliance to monitor, surveil, and interdict the sorties of the Northern Fleet to great advantage; deny or limit Soviet access to the Atlantic; and indeed serve as a springboard for offensive strikes against the Kola complex in a protracted, conventional war. By contrast, with north Norway in Soviet hands, the alliance could be outflanked in many respects, and the critical sea-lanes between America and central Europe could be placed at grave risk.[13]

The characterization of the northern flank as a strategic region first articulated in Dropshot and since adopted by many contemporary commentators remains a keystone premise for the continued commitment of U.S. military force to the region. The forecasting of a Russian invasion of Norway has been dominant in contemporary planning as well. The ebb and flow of the conditions underpinning the scenarios drove changes in both strategic estimates and the balance of military forces on the northern flank.

In the 1980s, the focus of the United States transitioned from central Europe to NATO's Northern Flank. This "rediscovery" of the region "resulted in extensive reinforcement plans, prepositioning of military material, fuel and ammunition and dramatically increased exercise activity in North Norway."[14] As a result of the U.S. Navy's new distribution of forces, the Soviets believed that "the U.S. now challenged and directly threatened the Soviet Union's second-strike capability," leaving the Soviets more vulnerable. In response, the Soviets instigated countermeasures for its navy that included developing defense systems to deter carrier groups supported by attack submarines and assigned its

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[12] "Phase I. Development of Tasks and Force Requirements: Establish or Expand and Defend Allied Bases as Required in NW Africa and Northern Africa," in *Dropshot*, ed. Brown, vol. 3, *The Strategic Counter-Offensive and the Defeat and Occupation of the USSR* (New York: Dial Press, 1978), 234–35.

[13] Col Joseph H. Alexander, "The Role of U.S. Marines in the Defense of North Norway," U.S. Naval Institute *Proceedings* 110, no. 5 (May 1984): 182.

[14] Kjell I. Bjerga, "Politico-Military Assessments on the Northern Flank, 1975–1990" (report from the IFS/PHP Bodø Conference, Norway, 20–21 August 2007), 6.

Table 8. Northern Flank scenarios during the Cold War

Scenario	Main idea	Time frame
The Soviet and U.S strategic missile exchange	Northern flank necessary for early warning in case of strategic missile exchange.	Endures throughout Cold War
The American strategic air power offensive against Northern Russia	Northern flank necessary for strategic bombers to conduct nuclear or conventional strategic bombing	Most influential in the 1950s and 1980s
The central fronts "tactical North Flank"	Northern flank as "second front" to enable the defeat of the USSR in a continental war on the central front	Most influential in the 1950s and 1960s
NATO flexible response, and the flank as a peripheral theatre of war	Northern flank as arena for deterrence by denial and flexible response	Most influential in the 1960s
The Barents Sea bastion, an independent theatre of war	Northern flank as arena for ASW against Soviet SSBNs IOT maintain deterrence or deny Soviet second-strike capability	Most influential in the 1960s and 1970s
Soviet fighting for access to the Atlantic Ocean	Northern flank as battle ground to decide command of sea in North Sea and Atlantic Ocean	Most influential in the 1970s
The fight for the Norwegian Sea	Northern flank as battleground to contain Northern Fleet at the GIUK gaps	Most influential in the 1970s and 1980s

Source: Gjert Lage Dyndal, "How the High North Became Central in NATO Strategy: Revelations from the NATO Archives." *Journal of Strategic Studies* 34, no. 4 (2011): 557–85.

own attack submarines to defend their strategic ballistic missile submarines in the Barents Sea. These changes also resulted in the Soviet Air Force taking on the responsibility of "attack operations against allied sea lines of communication."[15]

During the Cold War, forward maritime operations in the littorals on the northern flank resulted in changes that increased military activity and shifted the perceived balance of military power.[16] As observed in the northern flank scenarios, the prevalence of any given situation influences estimates of conventional deterrence, causing the various actors to adjust military forces by increasing operations, initiating competitive activities, and altering their technological investments. This pattern is evident in both the historical record and a survey of current literature, indicating that a current buildup of military capability in the Arctic region could destabilize security relations. The selection of the primary planning scenario is a key decision that will determine the character of competition and possibly conflict on the northern flank.

[15] Bjerga, "Politico-Military Assessments on the Northern Flank," 5.
[16] Department of the Navy, "Department of the Navy Releases Strategic Blueprint for a Blue Arctic," press release, 5 January 2021.

As these casual factors converged in the 1980s, two main arguments formed within NATO's intellectual community. The dominant argument—*active defense*—sought to use military power, with an emphasis on prepositioning, naval forces, and rapid reinforcement by brigade-size expeditionary forces to resolve the lingering security dilemma. It was anchored on the concepts of tripwire forces, deterrence by denial, conventional deterrence, a distinction between *vertical escalation*—employing more resources and more powerful weapons—and *horizontal escalation*—expanding a conflict geographically—and second front operations that influence prospect calculations thereby coercing an adversary into a position of disadvantage. Its proponents characterized the northern flank as a likely location for the outbreak of conflict because of ongoing territorial disputes, aggressive alliance-making and arms races, and the popularity of power politics and realist perspectives instead of liberal theories among the dominant powers.[17]

Champions of the counterargument—*passive defense*—contended that a proactive posture on the northern flank exacerbated deterrence instability, increasing the likelihood of conflict. They used similar scenarios to the active defense argument, but forecast different outcomes due to a dangerously high likelihood of a nuclear exchange. Passive defense supporters maintained that the use of naval forces—including amphibious forces and other quickly deployable land forces—to create, deny, or control strategic chokepoints would trigger an adversary to take preemptive actions or aggressive, escalating responses to resolve a spiraling security dilemma. They also claimed that mixing of general purpose and strategic forces in vicinity of second-strike capabilities and strategically valuable bastions increased the risk of escalation, obscured thresholds for the use of force, and created the possibility of inadvertent intensification resulting from miscommunication. These types of circumstances and causality led to an unintended escalation between NATO and the USSR during the former's military exercise, Able Archer 83. This war game in November 1983 caused concern among Soviet leaders who believed the United States and NATO would use it as cover for a full-scale invasion, triggering a crisis within the USSR. The response brought it and the United States the closest to a direct nuclear confrontation since the Cuban missile crisis in 1962.[18] The passive defense argument shared the same assessment of the likelihood of conflict, but sought to diminish the use of military power in favor of a mixture of deterrence, assurance, and diplomacy to resolve the security dilemma.[19]

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[17] Department of the Navy, "Department of the Navy Releases Strategic Blueprint for a Blue Arctic."
[18] "Able Archer 83—1983: A Crisis in the East/West Protracted Conflict," International Crisis Behavior Unit Data Viewer, 5 January 2004; and "Nuclear Close Calls: Able Archer 83," Atomic Heritage Foundation, 15 June 2018.
[19] Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Ithaca, NY: Cornell University Press, 1991), 129–58; and Barry R. Posen, "U.S. Maritime Strategy: A Dangerous Game," *Bulletin of the Atomic Scientists* 43, no. 7 (September 1987): 24–29, https://doi.org/10.1080/00963402.1987.11459567.

The Navy's 1982 Maritime Strategy, and the initial defense strategy of President Ronald W. Reagan's administration favored an active defense of NATO's northern flank.[20] Amid this effort, an opportunity emerged for the Marine Corps to connect its long standing, mandated role as the nation's expeditionary force-in-readiness to a budding requirement for a RDF on the northern flank. The gist of the argument was that Marines should be "designated for quick reinforcement of allied forces in Norway and Denmark." Keeping the Marines as an RDF and stationing other U.S. military units in the two nations, the proponents expressed, "would place far less emphasis on the Marines' amphibious capabilities, stressing instead a combination of pre-stocked equipment and the use of airlift as a means of rapidly deploying ground forces to NATO's northern flank."[21] In support of the active defense argument, according to one author, a flurry of papers, articles, and reports appeared in the headlines of naval service publications. Most of them took aspects of active defense and employed them to reinforce the idea that the prepositioning forces in Norway would take advantage of a combined-arms, naval expeditionary force. If the Soviets believed that this prepositioning action was a threat and diverted forces and resources, then this strategy was successful.[22] The early commitment of the Norwegian Air-Landed Marine Expeditionary Brigade (NALMEB) may possibly defuse a larger emergency or at least provide an additional crisis management tool. Consequently, NALMEB and Marine Corps Prepositioning Program-Norway (MCPP-N) originated to support deterrence for USEUCOM and NATO and manifested out of the active defense argument.

Evaluation of the Impact of the Current Posture

While current plans are classified, patterns of U.S. Marine Corps activities on the northern flank since the inception of NALMEB and MCPP-N in the 1980s indicate that little has changed. For instance, the last three exercises on or regarding the northern flank—Trident Juncture 2018, Cold Response 2020, and Marine Expeditionary Force Exercise 21.1—contained elements of the original posture, including the withdrawal of prepositioned stocks by elements of the Marine Air-Ground Task Force (MAGTF) rapidly deployed to theater as either a signal to Russia that NATO intends to defend Norwegian sovereignty or as an allied effort to restore Norwegian

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[20] John T. Hanley Jr., "Creating the 1980s Maritime Strategy and Implications for Today," *Naval War College Review* 67, no. 2 (Spring 2014): 11–30; and "Maritime Strategy Presentation (for the Secretary of the Navy, 4 November 1982)," in *U.S. Naval Strategy in the 1980s: Selected Documents*, ed. John B. Hattendorf and Peter M. Swartz (Newport, RI: Naval War College Press, 2008), 19–43.

[21] *The Marine Corps in the 1980s: Prestocking Proposals, the Rapid Deployment Force, and Other Issues* (Washington, DC: Congressional Budget Office, 1981), xi.

[22] Alexander, "Role of U.S. Marines in the Defense of North Norway."

sovereignty after a Russian attempt to alter the status quo.[23] Active defense adherents assume that since Norwegian sovereignty has not been violated since World War II, NATO must have implemented successful strategies along the northern flank. Within the Marine Corps, this assumption is used to justify the status quo and argue for the continued commitment of resources there as a critical part of the enduring effort to deter Russia. But it is important to question the validity of this assumption as well as the cause and effect relationship of it.

Several sources examine the utility of horizontal escalation to deter Russia. Recent scholarship, such as Michael Fitzsimmons's article titled "Horizontal Escalation," uses a declassified operations support directive memorandum to analyze potential strategies against the Russian Federation.[24] The Militarized Interstate Dispute (MID) dataset from the Correlates of War Project provides a supplement to further test these arguments and a better understanding of the initiation of MID by the USSR and Russia. This chapter's analysis assesses the potential causality between current Marine Corps posture on the northern flank and the fact that Russia has not violated Norwegian sovereignty since World War II.

Scholars have calculated Russian MID behavior in the region from 1946 to 2014. During this period, the USSR or Russia initiated 100 MIDs to reshape the status quo to their interests. Of those MIDs, 20 were territory related, 77 were policy related, and 3 were regime related.[25] Of those instances, the Russians employed a display of force 85 times and the actual use of force 74 times.[26] Russia never displayed or used force to revise the status quo with Norway, but during a 68-year period, the NALMEB and MCPP-N was only active for about 32 years. These statistics illustrate that the NALMEB and MCPP-N's posture may not have directly influenced Russian MID behavior toward Norway despite the former having retained the ability to bring forces to bear quickly into areas immediately adjacent to its borders while thwarting NATO counterattacks throughout most of the sample period.[27] Instead, the Soviet Union/Russia most likely did not exploit its military advantage because of the deterrence value of Norway's total defense concept, the possibility of a NATO Article 5 riposte, and the maturity of diplomatic mechanisms for resolving issues between Russia and Norway.[28] Therefore, it is more accurate to consider NALMEB and MCPP-N as part

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[23] "Mission Complete: 24th MEU Exercises Amphibious Capabilities during Trident Juncture 18," Marines.mil, 13 November 2018; "U.S. Forces to Hone Arctic Warfare Skills in Norway's High North in Exercise Cold Response 2020," Marines.mil, 3 March 2020; and "II MEF Marines Conclude MEFEX 21.1," Marines.mil, 18 November 2020.

[24] Michael Fitzsimmons, "Horizontal Escalation: An Asymmetric Approach to Russian Aggression?," *Strategic Studies Quarterly* 13, no. 1 (March 2019): 95–133.

[25] Glenn Palmer et al., "The MID5 Dataset, 2011–2014: Procedures, Coding Rules, and Description," Correlates of War Project, accessed 27 April 2021.

[26] Palmer et al., "The MID 5 Dataset, 2011–2014."

[27] Memorandum, "Horizontal Escalation Paper," 10 October 1980, ISCAP no. 2010-073, Under Secretary of Defense, National Archives.

[28] "Declassified: Norway and NATO," North Atlantic Treaty Organization, accessed 27 April 2022.

of a larger effort of the United States to signal Russia that it was committed to the collective defense of NATO. The cumulative effect of 32 years of Marine Corps commitment to NATO's northern flank strengthened the credibility of the organization's Article 5 to deter Russian aggression.

There are other reasons the presence of NALMEB and MCPP-N may not have influenced Russian behavior. First, the location of the Marine Corps footprint in the region is not ideal for reinforcing Norway's landward defense. Originally, Service planners located the Marine forces in north Norway, where it maintains a border with Russia and the units could contest an invasion. The footprint was moved to Trondheim in central Norway after Soviet diplomats used the 1949 Base Policy, which stipulated that Norway would take measures to keep allied forces away from the border to alter Norwegian decision making.[29] This compromise exemplifies how Norway manages its relationship with NATO and Russia to balance deterrence with assurance.

Military planners continue to wrestle with how the penalty of delayed access, distance from the projected main battle area, and limited lines of communication in the face of robust Russian military capabilities could impact the feasibility of NALMEB and MCPP-N functioning as designed.[30] During the last two decades, the Marine Corps adjusted MCPP-N for deployment as a theater prepositioning facility for Marine forces operating in Europe, Africa, and the Middle East. Additionally, the Marine Corps adjusted prepositioned equipment to support a shore-based, balanced MAGTF built around an infantry battalion, composite squadron, and logistics element enabled for crisis response operations up to a mid-intensity conflict, referred to as the Crisis Response Force Package (CRFP).[31] Also, the remnants of NALMEB, a rotational force called Marine Rotational Force-Europe, was terminated and shifted to an episodic model synched with the Norwegian exercise schedule supported by forces from II Marine Expeditionary Force (II MEF).[32] These decisions indicate that the Marine Corps has recognized the marginal return of its posture on the northern flank with its successive decisions to gradually reduce that position to provide resources to other priorities.

Recent exercises also illustrate that there is a low probability of the Russian invasion of Norway.[33] During the exercises Zapad 2017 and Ocean Shield 2020,

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[29] This policy is still in effect today. See, John Lund, *Don't Rock the Boat: Reinforcing Norway in Crisis and War* (Santa Monica, CA: Rand, 1989), 13–14.
[30] Ståle Ulriksen and Åse Gilje Østensen, *Building on Strength: Proposals for US-Norwegian Cooperation on the Operational and Tactical Level* (Laksevåg: Royal Norwegian Naval Academy, 2019), 2–10; author's observation of II MEFEX 21.1; Lund, *Don't Rock the Boat*; Maj Jerry L. Durrant, USMC, *The Norway Airlanded MEB's Role in Crisis Response for the 1990's* (Ft. Leavenworth, KS: School of Advanced Military Studies, U.S. Army Command and General Staff College, 1992), 21–39.
[31] *Prepositioning Programs Handbook: Appendix F to Marine Corps Installations and Logistics Roadmap (MCILR),* 3d ed. (Washington, DC: Headquarters Marine Corps, 2015) 5–6.
[32] *Prepositioning Programs Handbook*, 24–29.
[33] Allport, *Fire and Ice*, 6.

Russian scenarios involved the northern flank. Both maneuvers focused on a naval and air-centric effort to defend its interests and secure access to the Atlantic. These actions demonstrated that Russia could assure its second-strike capability through a multidomain defense-in-depth, establish control over parts of the Barents and Norwegian Seas, and contest the Greenland–Iceland–United Kingdom (GIUK) Gap.[34] In sum, past Russian MID behavior, analysis of Russian posture in the region, decades of consistent signals via Russian exercises, and the preponderance of intelligence analysis reinforces the likelihood that Russia does not intend to physically occupy Norway.[35] The Marine Corps, in coordination with the Joint force and key allies, should seek a posture capable of responding to Russia's multidomain threat.

Dropshot 2030

To illustrate the current posture's insufficiency in addressing the most likely Russian military action against NATO's northern flank, this chapter proposes an updated scenario, titled Dropshot 2030. The inspiration for this situation came from recent literature that emphasizes how the changing character of war necessitates a revamped posture for the Marine Corps on the northern flank.

The trigger in this scenario is a Russian gray-zone annexation of Svalbard. The island is the most likely flashpoint between Norway and Russia for three reasons. First, it is positioned near Russia and along the Northern Sea Route through the Arctic. Second, aspects of Svalbard's legal status are ambiguous and contested, creating opportunities for Russia to challenge Norwegian sovereignty without risking escalation or unacceptable costs. Finally, Russia and Norway are actively competing over the island and have been unable to completely resolve the matter diplomatically.[36]

To establish context for this new scenario, it is important to understand multiple assumptions. First, the status of Svalbard will remain an unresolved matter between Norway and Russia for the next decade. During that time, Russia would decide to annex Svalbard with a campaign beginning with actions below the level of armed conflict, similar to the operational approach of the 2014 Crimea annexation. In response, the United States and Norway would decide to contest this move without activating NATO's Article 5 by executing a campaign to reestablish Norwegian sovereignty. Finally, it must be presumed that the military modernization efforts

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[34] Katarzyna Zysk, *Russia's Military Build–Up in the Arctic: To What End?* (Arlington, VA: CNA, 2020); Allport, *Fire and Ice*; Njord Wegge, "Arctic Security Strategies and the North Atlantic States," *Arctic Review on Law and Politics* 11 (2020): 360–82, https://doi.org/10.23865/arctic.v11.2401.

[35] Christopher A. Ford and David A. Rosenberg, "The Naval Intelligence Underpinnings of Reagan's Maritime Strategy," *Journal of Strategic Studies* 28, no. 2 (April 2005): 379–409, https://doi.org/10.1080/01402390500088627; and Allport, *Fire and Ice.*

[36] Michael Zimmerman, "High North and High Stakes: The Svalbard Archipelago Could be the Epicenter of Rising Tension in the Arctic," *Prism* 7, no. 4 (November 2018): 106–23.

of all likely participants would proceed as planned and that Russia would keep the crisis localized to mitigate inadvertent escalation.

Dropshot 2030 envisions the Russian campaign beginning with a gradual reinforcement of its footprint at Barentsburg on Svalbard to shift the balance of the population in favor of Russia. With a small and declining Norwegian population on the island, this action would undermine the political control of the local Norwegian government based in Longyearbyen. Russia would then seek to nullify the 1920 Svalbard Treaty through diplomatic action supported by China. Russia would activate their military plan to deter a NATO response while its hybrid forces launch a coup to seize control of Longyearbyen. In the final phase, Russian multidomain attacks, although not including a direct invasion and occupation, would deter NATO's military response, compelling Norway to nullify the Svalbard Treaty and cede the island to Russia to avoid escalation. Norway's concession would create an opportunity for NATO and the United States to deescalate, terminating the crisis in favor of Russia.

For the Dropshot 2030 scenario, the CRFP supported by the Marine Corps does not provide a meaningful flexible deterrent option. Its presence in the region communicates the strength of U.S. commitments to treaty obligations and regional peace and stability and confronts the threat with unacceptable costs for its aggression. It also isolates the threat from regional neighbors and attempts to split the adversary coalition while rapidly improving the military balance of power in the area of responsibility without precipitating armed response from the threat.[37] Furthermore, the current posture, a reduced relic of the original MCPP-N/NALMEB construct, neither provides a credible message to shape adversary perceptions about the costs and benefits of undesired activity nor positions U.S. forces in a manner that facilitates implementation of operational plans/concept plans or operation orders if hostilities are unavoidable.[38] Even the Commandant of the Marine Corps recognized this fact in a recently published article, asserting,

> Our adversaries, confronting the United States' long-standing lead in the technologies and capabilities of the precision-strike regime, have chosen to employ "salami slicing" strategies that confront us with the alternatives of waging or threatening war over comparatively minor stakes, or accepting faits accompli in the form of local encroachments, annexations, or other violations of the rules of the established international order. Facing an adversary that has credibly fielded elements of a long-range reconnaissance-strike complex . . . the United States is in greater or lesser degree deterred.[39]

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[37] Maj Razy Molina, correspondence with the author; and *Joint Planning*, Joint Publication 5-0 (Washington, DC: Joint Chiefs of Staff, 2020).
[38] Molina, correspondence with the author.
[39] Gen David H. Berger, "The Case for Change: Meeting the Principal Challenges Facing the Corps," *Marine Corps Gazette* 104, no. 6 (June 2020): 8–12.

As Dropshot 2030 demonstrates, the hollow shell of active defense manifested in the remnants of MCPP-N and NALMEB is insufficient to meet the most likely challenges on the northern flank. This being the case, the Marine Corps should adopt a scenario like Dropshot 2030 to guide its planning for a future posture on the northern flank as the current posture there is insufficient to blunt a Russian ground invasion. This positioning is also inadequate in addressing a likely future scenario, the activation of a *bastion defense* to deter a response to a Russian annexation of Svalbard.[40] MCPP-N maintains enough supplies to outfit a shore-based, balanced MAGTF built around an infantry battalion, composite squadron, and logistics element, and to support a Marine Expeditionary Brigade-size force for 30 days. This prepositioned equipment, however, is not modernized and is of marginal utility when compared to the relative combat power immediately available to Russia, making it insufficient to meet the projected task.[41]

Additionally, the advertised utility of MCPP-N to support crisis or a contingency elsewhere is based on the single case of Operation Iraqi Freedom in 2003, when the equipment operated as a stopgap measure with questionable success.[42] While the cost of maintaining MCPP-N is relatively low, averaging about $10 million per year during the last decade, much of the cost is deferred by measures such as the European Deterrence Initiative.[43] Moreover, most equipment staged in MCPP-N is not modernized or optimized to support the forces envisioned by *Force Design 2030*. Correcting this mismatch would be expensive. For example, the initial investment in MCPP-N, made to resource the NALMEB concept, was estimated to be around $400 million in 1989.[44] When adjusted for inflation, a similar investment to modernize the remaining equipment would cost about $800 million in the 2020s. Such cost is not currently programmed into the Department of the Navy's budget as the current Commandant of the Marine Corps has repeatedly stated that he will not ask for "any topline increase for the Marine Corps—only

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[40] Bastion defense refers to the Russian strategy toward NATO on the northern flank that integrates submarines, air surveillance, and surface surveillance to locate, identify, track, and attack contacts to generate timely and accurate targeting data. Geir Arne Hestvik, *Conflict 2020 and Beyond: A Look at the Russian Bastion Defence Strategy* (Norfolk, VA: Combined Joint Operations from the Sea Centre of Excellence, 2020), 28.
[41] Mathieu Boulègue, *Russia's Military Posture in the Arctic: Managing Hard Power in a "Low Tension" Environment* (London: Royal Institute of International Affairs, 2019).
[42] Andrew, J. Bergen, "USMC Prepositioning Programs: Our Go-to-War Equipment and Supplies," *Marine Corps Gazette* 103, no. 3 (March 2019): 32–35.
[43] The European Deterrence Initiative (EDI) is a Department of Defense (DOD) effort that began as the European Reassurance Initiative (ERI) in June 2014. The Barack H. Obama administration launched it in an effort to reassure allies in Europe of the continued U.S. commitment to their security in the wake of Russia's 2014 invasion and occupation of Ukraine's Crimea region and instigation of conflict in eastern Ukraine. Paul Belkin, *The European Deterrence Initiative: A Budgetary Overview* (Washington, DC: Congressional Research Service, 2021).
[44] *Marine Corps in the 1980s*, 4; and *Prepositioned Stocks: Marine Corps Needs to Improve Cost Estimate Reliability and Oversight of Inventory Systems for Equipment in Norway* (Washington, DC: Government Accountability Office, 2015), 3–28.

that we be allowed to reinvest the savings we create by divesting of legacy capabilities and excess capacity."[45]

It is evident that the Marine Corps must decide how it will address the northern flank. From the current standings, MCPP-N has generally underperformed as an investment in deterrence, despite a more favorable performance as an assurance investment to bolster Norwegian confidence in NATO. Because its initial purpose provides little utility in future circumstances, the Marine Corps must reorient its posture to one that reinforces the littoral defense of Norway in response to Russia's bastion defense strategy. Such a stance, coupled with an aggressive exercise schedule nested with Norwegian and U.S. Navy forces, funded via the European Deterrence Initiative, would support recent strategic guidance in EUCOM's campaign plan.[46]

Proposed Posture

A revamped Marine Corps posture will enable the ability to execute naval campaigning and Joint warfighting on the northern flank in several ways. First, it invalidates the requirement for the current CRFP and allows the Marine Corps to divest unnecessary prepositioned capabilities. Second, it alters the prepositioning objective to support operations by a Marine Littoral Regiment (MLR) in the GIUK Gap. Third, it adds a cold weather all-terrain vehicle capability while sustaining the ability to equip a Marine Expeditionary Brigade with cold weather equipment. Fourth, it modifies the agreements with Norway to enable the U.S. Army to preposition material in the preexisting cave system. Fifth, a new agreement with Norway establishes the Rygge-Sola-Evenes-Ramsund base cluster as cooperative security locations (CSL) to enable distributed operations.[47] Finally, it reactivates Naval Air Station Keflavik as a CSL for the Joint force.

These adjustments could enable a more coherent response to the Dropshot 2030 scenario. Russia's bastion defense is designed to deter a NATO Article 5 response, but the United States and Norway may decide to respond by executing a campaign under the level of armed conflict to reestablish Norwegian sovereignty. To this end, the preponderance of the U.S. response would occur within a 15-day window. The land forces component, sourced from the U.S. Army, deploy an immediate response force as the tripwire to reinforce Norway's land defense and would be buttressed by a mobilization of a European-based armored brigade combat team.

The air force component would consist of reinforcements from European-based U.S. Air Force units bolstering the Norwegian Air Force. Theoretically, a modernized

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[45] Gen David H. Berger quoted in "Berger Reaffirms Commitment to Force Design 2030 Overhaul in Memo to New SECDEF," *USNI News*, 1 March 2021.
[46] Allport, *Fire and Ice*.
[47] *Supplementary Defense Cooperation Agreement between the Government of the Kingdom of Norway and the Government of the United States of America* (Washington, DC: Department of State, 2021), Annex A.

Norwegian Air Force would be comprised of 52 Lockheed Martin F-35A Lightning II fighter aircraft and 5 Boeing P-8 Poseidon patrol aircraft by 2030. The maritime component would involve a Carrier Strike Group (CSG) and an Amphibious Ready Group/Marine Expeditionary Unit (ARG/MEU) deployed to the Norwegian Sea to establish sea control. An MLR would support sea control from a position in the GIUK gap. In this Joint force approach to the defense of Norway, each component would exploit the current prepositioning system to augment its efforts, distributing the forces across various CSLs to mitigate the risk of operating inside Russia's weapon engagement zone. Deploying units already on continental Europe would alleviate the problem of operational reach that troubled planners for decades. Finally, such a construct could give the Joint task force commander multiple options to establish sea control in the Norwegian Sea and to project power into the Barents Sea because a Joint task force can support operational maneuver from the sea through land and air components in Norway. One such option would be to implement the ARG/MEUs to threaten any Russian attempt to invade northern Norway, while a CSG supported from the landward portion of the northern flank would hold Russian surface and subsurface assets at risk.

Given historical patterns of Russian behavior, the rapid deployment of a Joint task force capable of reinforcing Norway's landward and seaward defenses and penetrating a bastion defense would coerce Russia to retrograde by confronting them with unacceptable costs. With Russia deterred, Norway could deploy forces to suppress the coup, under the protection of a screen by U.S. forces to prevent further interference, and restore control over Svalbard.

As demonstrated in this vignette, modifying the U.S. posture to support both the landward and seaward defenses of the northern flank assures allies that it is positioned to deter Russia. Furthermore, this change would send a clear signal to Russia that the United States is prepared to rapidly improve the balance of military power on the northern flank with the necessary capabilities to neutralize a bastion defense. The ancillary benefit of these adjustments is that it enables the Marine Corps to recoup resources needed for ongoing modernization efforts while still contributing to the collective defense of an important ally without adding a burdensome requirement like NALMEB. While such changes will require collective action on the part of Norway, NATO, and the Joint force, the legacy of collective defense of NATO's northern flank indicate that such changes are feasible, supportable, and beneficial for all.

Conclusion

The Marine Corps investment in an ashore prepositioning program, paired with a brigade-size force to reinforce the landward defense of Norway, is regarded as unsustainable. As competing priorities and unforeseen contingencies emerged, the Marine

Corps decided to gradually withdraw from its investment. With a perceived shift in the balance of power in NATO's northern flank, the United States is exploring new possibilities to resolve a reemerging security dilemma.

The Marine Corps, once at the spearhead of such efforts, is at a decision point on how to generate a sustainable deterrent to Russia. The Corps is unlikely to return to MCPP-N and NALMEB as a feasible course of action. The most promising direction is to modify its approach by leveraging the Joint force, shifting the reinforcement of Norway's land defense to the U.S. Army, and concentrating the Marine Corps on its littoral defense. This transition is accomplished through the employment of formations like the MLR at strategic maritime chokepoints and MEUs along the periphery of Norway's coast.

Using the Maritime Prepositioning Force, and some stores maintained in MCPP-N, the Marine Corps could maintain the ability to deploy a Marine Expeditionary Brigade from the continental United States to support Norway's landward defense if the conflict escalated beyond the scope of the Dropshot 2030 scenario. As historical examples indicate, such intense conflict is unlikely in a region with strong diplomatic mechanisms to maintain low-tension. These proposed modifications to the posture are a way for the Marine Corps to buttress collective efforts on the northern flank with formations like the MLR and MEU as part of a broader maritime effort to reinforce the littoral defense of Norway.

Conclusion

Emergent Themes and Final Thoughts

Matthew R. Slater, PhD

The combined research of the authors demonstrates a convergence of ideas on the topics of emerging gray zone conflict requirements, logistics, partnering, the employment of specialized combatants, the application of expeditionary advanced base operations (EABO) in Europe, and the universal versus regional employment of EABO. Together, they address key challenges that the Marine Corps must address as it transitions to future littoral campaigns.

Gray Zone Conflict Requirements

Major Kendall J. Ignatz's research rests on key strategic questions for the entire U.S. military as opposed to the Marine Corps alone. His conclusions call for an examination of the right systems of procurement that support not just EABO, but many potential contingencies. In his assessment, Ignatz argues that just because the United States is investing in conventional systems designed to fight armed conflicts, these systems also contribute to defeating adversaries in gray zone conflicts. He identifies several areas where the United States made significant investments that are useful across the competition continuum that include cyberspace activities, space and space-based systems, and advanced capability enablers, such as microelectronics and artificial intelligence.

Rather than focus on one kind of scenario, Ignatz recommends that the United States invest in areas that support all possible operations. These capabilities, specifically integration with allies and partners, adequately trained personnel, cyberspace, and C4ISR, could serve both gray zone and armed conflict requirements. Contrary to the thoughts of many experts, he concludes that there can be a complementary relationship between preparing for armed conflict and gray zone operations. This procurement middle ground could enable the U.S. military to provide an effective deterrent to China, as well as prepare for unknown contingencies that occur where planners least expect.

Logistics

The many challenges associated with logistics during distributed operations are emerging as an essential topic to the success of EABO. The Marine Corps must contend with resupplying forces in the disaggregated geography of the South Pacific and in an environment unfriendly to communications. Major Stafford A. Buchanan's approach explores making Marines more self-sufficient and less dependent on communications and regular re-

supply. He points out that 70–80 percent of the logistics load deals with water and energy and then examines innovative ways to reduce this specific burden.

Although Buchanan's research illustrates how Marines can minimize their logistics footprint, the need for communication to request resupply still exists. This necessity is especially true because of the light loads required for mobility. Many analysts describe the multiple challenges associated with signature management.[1] The proliferation of sensors to locate electromagnetic signals requires the minimal use of communications, and even then, at significant risk. To reduce this hazard, Major Gloria C. Luedtke addresses satellite technology to circumvent kill chains and maintain logistics reliability for EABO.

Major Nicholas S. Lybeck takes a broader approach to examining the concept of seabasing in the EABO context. He argues that seabasing is still a viable concept but requires updating to meet EABO requirements. His ideas revolve around the meaningful incorporation of partners into the logistics mission. Although Lybeck recognizes that depending on exterior partners creates a potential operational problem, he contends that any conflict with the People's Republic of China (PRC) will have to be executed in conjunction with regional allies to have any chance of sustainability.

The Multinational Requirement

So what does a deeper level of integration look like? Likely, it would possess a common operating picture of the supply chain, increased multinational training, and deeper economic integration with partners to provide manufacturing redundancy and dependable infrastructure. This combination will take a more prominent diplomatic effort, the theme of Major Marianne C. Sparklin's research. Sparklin argues that common interests based on shared political and defense-related values form the basis of a strong alliance between the United States and its regional allies across the U.S. Indo-Pacific Command (USINDOPACOM). A deeper level of partnering centered on shared goals is required to execute stand-in forces. The common threat of the Soviet Union is what made NATO enduring, whereas some analysts believe it led to the dissolution of SEATO.

While some critics may claim that U.S.-led multilateral institutions would likely not succeed based on SEATO's example, Sparklin points out that times have changed. The mutual fear of the PRC and a more vital adherence to democratic values could create a much tighter bond between regional states leading to growing cooperation. Even though Sparklin conceptualizes a NATO-like multilateral organization for fostering partnerships in the Pacific, she also contends that this relationship would be markedly different. Whereas NATO was committed to the

[1] For a detailed explanation, see Chris Cruden, "Manhunting the Manhunters: Digital Signature Management in the Age of Great Power Competition," Modern War Institute at West Point, 3 May 2021.

potential destruction of the Soviet Union, this possible Pacific corollary only seeks to deter the PRC, which may call for a less formal arrangement. To successfully execute stand-in forces, however, a deeper level of integration must occur than what exists today.

Lybeck agrees with Sparklin regarding the need for broader and deeper connections to prevent potential PRC aggression. The PRC exploits economic development and military coercion to spread its influence in USINDOPACOM. Economic initiatives, such as the Belt and Road Initiative, erode U.S. influence by removing financial networks. This manipulation decreases the ability of the United States to execute EABO as it requires forward basing. Lybeck points out that regrowing U.S. influence will require a "greater use of economic statecraft and 'geoeconomics' to improve maritime access in the Indo-Pacific region through infrastructure investment and overseas manufacturing." Stronger U.S. cooperation will have to include basing rights and employment of infrastructure with allies to buttress seabasing which is essential for executing EABO in the area of operations.

The Role of Specialized Units

These regional partnerships would allow the United States to forward deploy reconnaissance teams to sense adversary attacks in advance. Major Matthew R. Hart believes that the ability of the Marine Corps to employ a multidomain reconnaissance force up to six months in advance of hostilities is key to making EABO successful and winning future conflicts with the PRC. The extensive time in the area of operation is essential to permit a reconnaissance unit to monitor and become familiar with the adversary's electromagnetic activity and determine when significant changes signal an imminent attack. Further, Hart asserts that this reconnaissance force works to deny key maritime terrain from the PRC, which curtails its ability to project power centered on the basing of its cruise and ballistic missiles.

However, Hart declares that the new role for Marine Corps reconnaissance creates a significant capability gap. During operations in the Middle East in the late twentieth and early twenty-first centuries, the Marines deployed reconnaissance units as light infantry battalions. The sudden shift to fighting a peer competitor created a challenge in meeting the Commandant's guidance because these units, as Hart writes, "lack the requisite fieldcraft, command and control, and specialized skills training to survive and persist as the inside force in a conflict with the Chinese." Among several suggestions, he contends that the Marine Corps must create regionally aligned reconnaissance regiments that can be directly tasked by the Joint force maritime component commander, train to special operations standards, and acquire new skill sets for politically and physically challenging environments.

EABO Execution in NATO's Northern Flank

Both Lieutenant Colonel Thomas E. Driscoll and Major Alexander T. Luedtke both focus on the application of EABO against the Russian Federation rather than the PRC in the South Pacific. Driscoll points out that Russian advantages in multidomain operations and maneuver and fires capabilities charges the Marine Corps to create new formations if they hope to compete in the northern Europe theater. The author proposes the Littoral Maneuver Force (LMF) that could incorporate tactical maneuverability, fires, reconnaissance, collection, counter-electronic warfare, and air and surface threat protection. The LMF is tailored to fight in the region's highly urbanized and compact littorals as smaller vessels that can conduct precise raids and maneuver around the proliferation of commercial ships could patrol the areas. Whereas Russian forces emphasize land domination, the LMF could allow the Marine Corps to counter with naval firepower and control the sea domain. Driscoll provides a vision of how the underpinnings of the EABO concept can be adapted to NATOs northern flank by living up to the Commandant's guidance to deepen integration between the Navy and Marine Corps.

In Luedtke's chapter, he proposes a new approach, or posture, for NATO's northern flank. He exposes that the current plan and force deployment are antiquated and poorly supported. As a result, NATO would have an inadequate response to Russia's likely course of action. He recommends a new posture that allows the Marine Corps to concentrate on the littoral defense of Norway with modern formations like the Marine Littoral Regiment. Luedtke indicates that, historically, regional states tend to fight below the level of conflict. Therefore, the deterrent effect of forces that present a credible threat to Russia will prevent a full-blown war.

Parting Thoughts

As usual with thoughtful research, the topics and ideas presented here raise as many questions as they answer. One of the shared assumptions for the authors was the challenge of peer competition, although historians point out that the most likely future conflicts will be counterinsurgencies. During the interwar period of the 1920s and 1930s and the Cold War, great power confrontation mainly occurred through low-intensity conflict, fulfilling great power ambitions without risking broader conflict. As cyber and critical infrastructure protection specialist John Vrolyk contends, there is an essential distinction between preparing to win in a great power conflict and enduring a great power competition.[2]

The notion that low-intensity conflict is the most likely form of future confrontation is not radical. Recent Joint doctrine explains that must plan modern conflicts

[2] John Vrolyk, "Insurgency, Not War, Is China's Most Likely Course of Action," *War on the Rocks*, 19 December 2019.

based on the entire competition continuum, including peace and war, and addressing all dimensions of competition, such as economy, politics, society, and military.[3] One view of the EABO concept is that it represents the integration of disruptive technologies into the Joint force. If this is true, then the impact of EABO-enabling capabilities on counterinsurgency and foreign internal defense-type missions should be imperative. What does EABO add to the counterinsurgency or foreign internal defense order of battle when its single purpose is to confront a peer competitor? If EABO and counterinsurgency are mutually exclusive, is it wise for the Marine Corps to fully commit to this concept and relearn painful lessons from Operations Enduring Freedom and Iraqi Freedom?

The chapters here address scenarios involving peer competitors primarily because EABO is a reaction to perceived capability gaps in the South Pacific. Are EABO principles effective against mid-level competitors, such as Iran and North Korea, who lack integrated kill chain technology? Do these scenarios call for a continuation of close-in fighting capability, and how does the U.S. military maintain a hybrid force that is proficient in both?

The complicity of the new world order and rapidly changing technologies drive the Marine Corps toward historical changes in the way it fights. This edited volume demonstrates how students attending the Command and Staff College and School of Advanced Warfighting at Marine Corps University are innovating to support the significant changes put into motion by General David H. Berger's guidance. Although the Commandant's publication of *Force Design 2030* signals a termination date for the current round of Service experimentation, it is more likely the herald of an era of continuous innovation. The notion of the competition continuum and the quickening cycle of technological improvement will persist in challenging the Marine Corps to plan and operate in chaos.

This bedlam can only be transformed into understanding by a committed effort to out-innovate the PRC, Russian Federation, and other adversaries at all levels of warfare. The work by the current authors demonstrates how Marines must compete by applying critical academic thinking to practical Marine Corps warfighting problems. EABO will eventually give way to newer concepts, and the concept's controversies will give way to other contests. Perhaps what is more important than the conclusions that each writer reached is the demonstrated commitment to developing new solutions to operational problems. This pattern must be replicated by future Marines so that the United States can deter or win future conflicts.

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[3] *Competition Continuum*, Joint Doctrine Note 1-19 (Washington, DC: Joint Chiefs of Staff, 2019), 8.

GLOSSARY OF SELECT TERMS

The definitions in this glossary are intended as quick references and are by no means exhaustive. Many of these terms are new concepts that are under constant development. These definitions were accurate at the time of publication. For comprehensive definitions with citations, please see the appropriate chapters where the concepts or terms are discussed.

Active defense: a military concept that incorporates offensive actions into defensive strategy. A military force employs limited offensives and counterattacks to deny an adversary access to a contested position.

Alliance: the relationship that results from a formal agreement between two or more nations. It is frequently created to achieve broad, long-term objectives that further their common interests.

Amphibious Ready Group: an amphibious force made up of a naval element, an amphibious task force, and a landing force usually of U.S. Marines, but occasionally including U.S. Army soldiers. Totaling approximately 5,000 personnel, this group is trained, organized, and equipped to perform amphibious operations specifically.

Antiaccess/area-denial (A2/AD): Antiaccess consists typically of long-range actions, activities, or capabilities designed to prevent an advancing enemy force from entering an operational area. Area denial involves typically short-range actions, activities, or capabilities designed to limit the actions of an enemy force within an operational area. Today, great powers attempt to combine the two elements to influence their regional standing and military capabilities.

Archipelagic defense: a military concept oriented toward protecting the first island chain in the Western Pacific from Chinese aggression through a series of interrelated defenses along it.

Armed conflict: a dispute that concerns a government and/or territory where two parties, one of which is the government of a state, use armed forces in a struggle that results in 25 battle related deaths in a calendar year.

Article 5: the collective defense article of the North Atlantic Treaty Organization (NATO). This article supports the concept that an attack against one NATO member is an attack against all members, which will take responsive actions they deem appropriate.

Balance of power theory: a concept in which a nation or group of nations use their power to offset the power of an adversary to protect their interests. It has been employed historically to ensure the geopolitical status quo and political stability. Power is the product of several different components, including population, economic and military capability, technological skill, and political cohesion.

Balance of threat theory: a political concept that claims that nations form alliances to protect themselves from adversaries that possess superior resources and pose a threat to a nation's independence or security. Similar to balance of power theory, it is used to maintain a regional status quo. The degree to which a state threatens others is the product of its aggregate power, its geographic proximity, its offensive capability, and the aggressiveness of its intentions.

Bandwagoning: when a state aligns with a stronger, adversarial power and concedes that the stronger adversary-turned-partner disproportionately gains in the spoils they conquer together. It is a strategy employed by states that find themselves in a weak position.

Bastion defense: a Soviet naval concept meant to protect strategic submarines. Developed in the 1950s and 1960s alongside the rise of intercontinental missiles, the bastion defense created a layered defense to prevent Western navies from threatening the Soviet submarines.

Belt and Road Initiative: Chinese infrastructure project extending from East Asia to Europe following a similar route as the original Silk Road. Started in 2013 under President Xi Jinping, the investments and developments are meant to expand China's economic and political influence.

Collective defense: a principle of accepting the bond of providing all possible assistance, including military assistance, in the case of a member state being attacked from the outside. The security of member states is not assumed to be threatened from the inside of the alliance as it is oriented toward an external enemy.

Command-and-control (C2): exercising of authority by a properly designated commander over attached forces in an operation. C2 functions allow a commander to plan, direct, and control forces and operations through an arrangement of personnel, equipment, communications, facilities, and procedures.

Competition: a range of military activities and operations that nations use to achieve political objective and deny the goal of any adversarial actions. These actions exist on a continuum between cooperation and direct armed conflict. In between, states compete in varying states of collaboration and confrontation.

Competition continuum: both state and nonstate actors persistently compete in the areas of diplomacy, economics, and strategy to gain an advantage on the international stage. This situation places these actors in a state of flux between peace and war. This continuum describes the enduring competition that occurs through cooperation, competition below armed conflict, and armed conflict.

Crisis: a rapidly developing incident or situation that threatens a nation, its citizens, military forces, or vital interests. This situation creates a condition of diplomatic, economic, or military importance that it may require a commitment of military forces and resources.

Cross-domain coercion: a description of Russian efforts to deter and compel adversaries by orchestrating soft and hard instruments of power across various domains, regionally and globally. These instruments include non-nuclear deterrence, informational deterrence, and nuclear deterrence.

Deterrence: preventing an action by creating a believable threat of an undesirable counteraction or the belief that the expense of such action outweighs the possible benefits.

Distributed maritime operations (DMO): an operational approach to winning a high-end future fight at sea. It consists of the Navy and Marine Corps integrating and leveraging multidomain platforms and technologies to increase overall

lethality and decrease susceptibility to attacks from an adversary. A system related to DMO has the capability to extend offensive firepower and provide collective defense over a large geographic area and across all operating domain.

Domain: the sphere of an operating environment that possesses unique characteristics that require specialized military doctrines, organizations, and equipment to effectively control and exploit the arena. Typically, these realms consist of the physical areas of land, maritime, air, and space as well as cyberspace.

Expeditionary advanced bases: a location within the weapons engagement zone of a potential opponent that provides essential security and support capabilities to host, sustain, and maintain inside forces. Their flexibility and mobility allow them to support multiple missions and functions while making them difficult or inopportune targets. They deliver the same essential functions of traditional bases with less vulnerable and more resilient support infrastructure.

Expeditionary advanced base operations: a military doctrine that calls for employing Marines as an "inside," low signature, joint naval force conducting sea control and denial operations in littoral and chokepoint regions. It advances and sustains naval and joint sensor, shooter, and sustainment capabilities of the inside force to leverage the decisive massed capabilities of the outside force with enhanced situational awareness, augmented fires, and logistical support. It also enables the U.S. Navy's forces to exercise twenty-first century naval operational art, meet new A2/AD threats, and operate and thrive in and around close and confined operational spaces.

Fait accompli: actions that allow a nation to impose gains at the expense of an adversary without initiating a larger war. They typically consist of limited land grabs based on the idea that the opponent would not risk a significant fight for the territory.

First island chain: a line of islands off the coast of East Asia extending from the Japanese Home Island to the Philippine archipelago. The positioning of these islands provides a possible barrier to China's expansion in the region by confining the People's Liberation Army Navy to China's coastal waters. It is considered the first line of defense within the island chain strategy the United States has used in the Western Pacific.

Forward basing: the practice of deploying equipment, armed forces, and persistent military facilities abroad or at sea during peacetime. It is meant to project national power, deter potential adversaries, and stabilize potentially volatile regions. It can also help a superpower dissuade military competition in particular spheres of influence.

Freedom of navigation operations: an operation conducted to protect U.S. or international navigation and overflight rights as well as related interests on, under, and over the seas.

Gray zone: a series of steps meant to secure strategic leverage that remain below the threshold of armed organized violence to avoid generating a powerful response. These typically consist of covert or illegal activities of nontraditional statecraft

that includes disruption of order, political subversion of governmental or nongovernmental organizations, psychological operations, and financial corruption.

Great power: a nation that displays three conspicuous attributes: capabilities, behavior, and status attribution by other states in the international system. It has unusual capabilities in comparison with other states that it uses to pursue broad foreign policy interests. It is perceived by other states as having a powerful influence, and is treated accordingly.

Great power competition: a framework for understanding global interstate relations that dominated global affairs for centuries. Typically, at least two states, the United States and China for instance, compete for economic and political influence. This challenge creates tensions among the great powers that can pull regional actors into conflicts.

Hard power: the coercive use of military and economic power to achieve political sway.

Heartland: a geopolitical theory established by Halford J. Mackinder that posits that the state that controls the interior of central Asia would control the world. Based on the needs for raw materials to support military powers, Mackinder believed that the area from Siberia to the central Asian highlands held the most importance to maintaining the forces needed to act as a great power. By maintaining control of this area, a world power could then spread their influence to the peripheries of Europe, South and Southeast Asia, Western Asia, Africa, and the Americas.

Hedging: when a state conducts a counteracting policy to temporarily avoid an explicit confrontation with a potentially adversarial state. Taking this stance acts as an insurance policy against opportunism.

Hegemony: an era when one nation tends to dominate world politics. In this situation, a world power dominates the economic, social, and ideological spheres. The United States, for example, maintained a period of hegemony between the end of the Cold War in 1991 and the mid-2010s.

Hider/finder competition: a competition between innovations, countertactics, and countermeasures dealing with sensors meant to detect adversaries in multiple domains. Typically, this contest consists of hiding from enemy sensors while also detecting enemy targets.

Horizontal escalation: actions that expand a conflict's geographic scope. Usually, it consists of conducting operations in nations or regions that combatants had previously considered neutral.

Hybrid warfare: a type of conflict that includes the blending of conventional and unconventional means to wage war politically and militarily. This approach attempts to injure an adversary as optimally as possible. It also obscures the line between war and peace time.

Indo-Pacific region: a geopolitical sphere that encompasses parts of the Indian and Pacific Oceans. This region has become a central area of focus for the great power competition between the United States and the People's Republic of China.

Inside force: a military force that operates within an adversary's weapons engagement zone, especially in littoral environments.

Intelligence, surveillance, and reconnaissance: activities that combine the arranging and employment of sensors, assets, and various systems that directly support existing and potential operations. These elements consist of consolidated intelligence and operations functions.

Interoperability: the ability of the Services to act together coherently, effectively, and efficiently to achieve tactical, operational, and strategic objectives. It also applies to the ability of communications-electronics systems or items of communications electronics equipment to exchange information or services directly and satisfactorily between them and/or their users.

Littoral: a battlespace that is comprised of two areas of operation. Seaward littorals are the area from the open ocean to the shore that requires control to support operations ashore. Landward littorals are the area of land extending from the shore that can be defended directly from the sea.

Littoral Antiair Battalion: a unit of the Marine Corps designed to assist in expanding capabilities in the littoral environments. This battalion is intended to provide support for Marine Littoral Regiments through air defense, air surveillance and early warning, air control, and forward arming and refueling in littoral operations.

Littoral Logistics Battalion: a unit of the Marine Corps designed to provide logistical support to littoral forces. This battalion will take on the role of resupplying expeditionary advanced bases, maintaining cache sites, providing medical and maintenance capabilities, and ensuring a connection with higher-level logistics providers.

Joint Force Maritime Component Command: a type of unified command or joint task force taking part in maritime operations. This force is placed under the leadership of the Joint Force Maritime Component commander, who had the responsibility of planning and coordinating the command's operations.

Joint Task Force: a military force made up of units from multiple Services to quickly respond to spontaneous crises. The organizational structure capitalizes on the unique capabilities of each Service while also providing flexibility for the size and makeup of the force necessary to react to the specific mission or crisis.

Marine Air-Ground Task Force (MAGTF): the principal organization for the Marine Corps for all its missions. Consisting of a command element, an aviation combat element, a ground combat element, and a combat service support element, it is placed under a single commander and is capable of responding rapidly to any crises throughout the world. Although its structure never varies, the makeup of the units in it are always mission dependent.

Marine Expeditionary Brigade (MEB): is a MAGTF that consists of a reinforced infantry regiment, a composite Marine aircraft group, and a brigade service support group. A MEB is organized to respond to specific situations and can function independently, as the lead unit of an expeditionary force, or as part of a Joint task force. It has the ability to conduct missions across the full range of operations.

Marine Expeditionary Unit (MEU): is a MAGTF that is organized with a reinforced infantry battalion, a reinforced helicopter squadron, and a task-specific combat service support element. It is usually deployed to establish forward seabasing and can be used for an immediate crisis response, but typically has limited combat operations. Rarely, an MEU can have special operations capabilities that is made up of specially trained personnel and equipment to conduct amphibious operations and other limited, specialized missions.

Marine Littoral Regiment (MLR): a self-deployable, multidomain force that is optimized to enable maneuver and operations in maritime domain and that can operate across the entire competition continuum. It is designed to prepare and support expeditionary advanced base operations in the littoral environment.

Maritime Prepositioning Force (MPF): a maritime force that consists of ships in a Maritime Prepositioning Squadron and the gear and equipment on them. It is designed to support MAGTF maritime operations in a littoral environment, but remains vulnerable to attacks from an adversary when in use.

Multilateralism: embracing cooperation with other countries and international institutions in pursuit of common goals. It carries the cost of continuing to commit resources to international efforts and potentially sacrificing a degree of national autonomy.

Mutual defense: an agreement between two or more nations that guarantee they would come to each other's aid when attacked or threatened. Primarily, these relationships consist of one prominent power and smaller, less powerful states. Numerous nations entered into this setup during the Cold War.

Nine-dash line: a line created by the Kuomintang Chinese government and continued under the People's Republic of China that claims sovereignty over islands and sea routes in the South China Sea. The unclear purpose behind the claims has created tension within the region and globally.

NATO's northern flank: the Scandinavian nations of Finland, Sweden, Norway, and Denmark. Historically, it has been and still is considered the most vulnerable region for any Russian threats against NATO members in Europe.

Partnership: less formal than alliances, this approach, often called "strategic partnerships," helps build relationships between nations or organizations. Like alliances, they benefit the members of the partnership, but they can be short term and do not involve a treaty.

Passive defense: a military doctrine that supports employing actions meant to reduce the probability of and minimize the effects of damage caused by a hostile action without using offensive tactics. The concept provides for a state to protect its interests without provoking any adversaries.

Pivot to the Pacific: a new foreign policy structure under the President Barack H. Obama administration. It reoriented the central focus of U.S. foreign policy from Europe and the Middle East to East Asia. Although symbolic in nature, it was meant to establish the Pacific region as the main geopolitical area for the United States for the next century.

Power projection: the finite application of military power by a national command authority to achieve discrete political ends outside of a nation's borders, territories, and possessions.

Operational access: the ability to project military force into an operational area with sufficient freedom of action to accomplish the mission.

Operational control: command authority that can be given to commanders at any level at or below combatant command. It gives these officers authority to perform functions of command that are necessary to accomplish an assigned mission, but does not include power over direction for logistics or matters of administration, discipline, internal organization, or unit training.

Operational preparation of the environment: an activity that prepares both a physical space and a local population for military operations. These actions can include direct military action, such as establishing a landing area or beachhead, or indirect operations, such as propaganda campaigns to turn populations against the established government, to open the area for combat units. It is meant to reduce the likelihood of surprises or uncertainty during an operation.

Outside force: a military force that operates outside of an adversary's weapons engagement zone. These elements typically provide support for inside forces during an operation.

Rapid Deployment Force: a highly mobile force that can be deployed to any crisis. These forces are specially trained and equipped for rapid movement and special missions. For the U.S. armed forces, this has typically consisted of units with the ability to deploy to regions outside of Europe, Japan, and the Korean Peninsula.

Reflexive control: a military intelligence theory first developed in Russia that emphasizes controlling the perceptions of decision makers. It is a means of transmitting specially prepared information to either an ally or opponent that forces them to make the predetermined decision that the initiator desires.

Regional security: a geopolitical approach that emphasizes military, economic, and political alliances and agreements within a geographic or cultural region to ensure the security of regional states. Many of these alignments include formal treaties, such as NATO, that guarantee protection among the member states.

Rimland: the region used by political scientist Nicholas J. Spykman to challenge Mackinder's Heartland Theory. Comprised of nations and continents that would rely primarily on seapower, the Rimland, according to Spykman, had a greater opportunity for political domination globally due to their access to the oceans. The Rimland Theory of geopolitics is based on the superiority of sea power to land power throughout history.

Salami-slicing tactics: tactics that involve the slow accumulation of small changes, none of which in isolation amounts to a casus belli, but which add up over time to a substantial change in the strategic picture.

Seabase/seabasing: a process for supporting units related to amphibious operations. It places the basing of certain landing force support functions aboard ship rather than onshore, reducing the size of the shore-based presence.

Second island chain: the second set of islands incorporated into the island chain strategy of the United States. This second line of defense extends southeast from the Japanese Home Islands, through its Bonin and Volcano Islands, then along the Mariana and Western Caroline Islands, and ending at Western New Guinea. Similar to the first island chain, this position is meant to confine the People's Liberation Army Navy to an area of the Western Pacific.

Soft power: the use of a nation's culture, institutions, and businesses, among other elements, rather than military power to influence other nations.

Sovereignty: states have the freedom to govern themselves as they choose, with full control over their internal and external affairs and free from interference or intervention.

Special Operation Forces: military units designated by the secretary of defense and specifically trained and equipped for conducting and supporting special operations. These forces are deployed for various missions ranging from combat and counterterrorism actions to hostage rescues and humanitarian aid. These units also conduct politically sensitive missions and are part of all the Services.

Stand-in forces: forces with disruptive tactical capabilities that will persist and operate forward within an adversary's weapons engagement zone. During day-to-day competition, stand-in forces enable the United States and its partners to confront fait accompli gambits and malign behavior with proportionate, responsive, and credible military options to match an adversary's aggression.

Vertical escalation: an escalation that entails a rise in the intensity of armed conflict. This intensification may include employing new weapons or incorporating new targets into the struggle.

Weapons Engagement Zone: a defined dimension within which the responsibility for engagement resides with a particular weapon system, typically related to air defense. Amphibious operations usually take place within this area.

Whole-of-government approach: a political approach that emphasizes a cooperative response from various agencies and departments of a government to achieve a specific goal. It is meant to incorporate the various expertise and resources of these agencies to address the issue at hand.

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Major Stafford A. Buchanan is an alumnus of Hampden-Sydney College, class of 2006, and joined the Marine Corps out of Pinehurst, North Carolina, in January 2008. After attending The Basic School and Combat Engineer Officers' Course, he checked into Combat Assault Battalion in Okinawa, Japan. He served as a Combat Engineer Platoon commander from 2010 to 2012, deploying in support of the 31st Marine Expeditionary Unit, Operation Tomodachi, and Operation Enduring Freedom. In early 2013, he received orders to Marine Corps Logistics Base Barstow, California, where he served as the headquarters battalion commander and the deputy base operations officer until 2015. Major Buchanan then attended the Expeditionary Warfare School at Marine Corps University in Quantico, Virginia, from August 2015 to June 2016. After graduation, he received orders to Combat Logistics Battalion 2 in Camp Lejeune, North Carolina. He served as the Headquarters and Services Company commander, the Engineer Services Company commander, and the battalion operations officer. From 2018 to 2020, Major Buchanan worked at the Marine Corps Engineer School on Camp Lejeune. He served as the utilities instruction company commander for two years before attending the Command and Staff College at Marine Corps University during the 2020–21 school year. Major Buchanan was a distinguished graduate and received his Master's in Military Studies in May 2021. Currently, he serves as the squadron operations officer for Marine Wing Support Squadron 174 in Kaneohe Bay, Hawaii. He is accompanied by his wife Karen Santos and his two children—Stafford A. Buchanan II and Scarlet-Mei Santos Buchanan.

Lieutenant Colonel Thomas E. Driscoll is currently serving as a Marine Air-Ground Task Force (MAGTF) planner with II Marine Expeditionary Force. An Infantry Officer, Driscoll served in 3d Battalion, 4th Marines, deploying twice to Operation Iraqi Freedom, and in 2d Battalion, 1st Marines, deploying with the 11th and 13th Marine Expeditionary Units. In the supporting establishment, he served as an instructor at The Basic School and Infantry Officer's Course and the Commanding officer, Marine Corps Recruiting Station Sacramento, California. Lieutenant Colonel Driscoll is a graduate of the United States Naval Academy (BS Electrical Engineering), Marine Corps Expeditionary Warfare School, Marine Corps Command and Staff College (Distance Education Program), Marine Corps School of Advanced Warfighting, and is currently enrolled in the Army War College Distance Education Program.

Major Kendall Ignatz currently serves as an information operations planner assigned to Marine Forces South. He commissioned in May 2011 from the U.S. Naval Academy in Annapolis, Maryland. He is a distinguished graduate of the Combat Engineer Officer's Course and the U.S. Army Engineer Captain's Course as well as a graduate of the Expeditionary Warfare School Distance Education Program, the Aviation Ground Support Weapons and Tactics Instructor Course, and the Marine Corps Command

and Staff College. Major Ignatz' assignments include tours with 7th Engineer Support Battalion, Marine Corps Logistics Base Barstow and Marine Wing Support Squadron 274. He also conducted an Operation Enduring Freedom deployment to Afghanistan with Combat Logistics Battalion 1. Major Ignatz has a bachelor's degree in history from the U.S. Naval Academy and a master of military studies degree from Marine Corps University. His personal awards include the Navy and Marine Corps Commendation Medal, twice, and Navy and Marine Corps Achievement Medal. Major Ignatz is married and has a daughter and a son.

Major Alexander T. Luedtke is currently serving as a planner at the 1st Marine Division. A native of Ames, Iowa, Major Luedtke graduated from Rockhurst University and was commissioned in 2007. As a lieutenant, he served as a platoon commander and operations advisor with 2d Battalion, 1st Marines, during deployments to Operation Iraqi Freedom and Operation Enduring Freedom. As a captain, he served as the Headquarters and Service Company commander, 2d Battalion, 2d Marines, for a deployment to the Black Sea Rotational Force. After redeployment, he assumed command of Fox Company, 2d Battalion, 2d Marines. Following an assignment at Combined Joint Task Force-Operation Inherent Resolve (CJTF-OIR), Captain Luedtke served as the weapons company commander for 2d Battalion, 8th Marines, for a deployment to the Black Sea Rotational Force. As a major, Luedtke served as the fleet antiterrorism security team company commander for Central Command. His tours in the supporting establishment include service as an instructor at the advisor training group in TwentyNine Palms, California. His Joint assignments include service as a force generation officer and battle captain for Combined Joint Task Force Inherent Resolve. Major Luedtke is a graduate of Infantry Officer Course, Marine Advisors Course, Expeditionary Warfare School (nonresident), Winter Mountain Leaders, Tactical MAGTF Integrators Course, Weapons and Tactics Instructor Course, Marine Corps Command and Staff College (resident and nonresident), and the School of Advanced Warfighting. He holds master's degrees from Webster University and Marine Corps University.

Major Gloria Luedtke is a logistics officer who graduated from the Command and Staff College at Marine Corps University. She is currently the 1st Transportation Battalion operations officer. Previously, she held logistics billets from 1st Marine Logistics Group, Marine Corps Recruit Depot San Diego, 2d Air Naval Gunfire Liaison Company, and Task Force 51/5th Marine Expeditionary Brigade.

Major Nicholas S. Lybeck was born and raised east of Seattle, Washington, and graduated from the University of Washington with a degree in law, society, and justice. He was commissioned after completion of Officer Candidate School in August 2007.

In addition to his undergraduate degree, Major Lybeck was awarded a master's degree in public administration from the University of Southern California in 2014 and a master's degree in military studies from Marine Corps University in 2021. Major Lybeck's operational assignments include service in command and staff positions within each element of the MAGTF and the supporting establishment. He has deployed to Afghanistan in support of Operation Enduring Freedom and deployed to the U.S. Indo-Pacific Command area of responsibility as part of the Unit Deployment Program. His most recent operational assignment was with Combat Logistics Battalion 7 in TwentyNine Palms, California, where he served as the Executive Officer and Operations Officer during his tenure. During this assignment, Major Lybeck served as detachment commander of a 170-person combat logistics detachment in support of Special Purpose Marine Air-Ground Task Force 7 during Exercise Northern Edge 2019 in Alaska.

Major Matthew R. Hart is a Marine Air-Ground Task Force (MAGTF) intelligence officer currently assigned as the executive officer, 3d Radio Battalion. He has served the reconnaissance community as a battalion intelligence officer, platoon commander, company commander, maritime raid force commander, and special mission branch officer. He has also served as a company commander at the 2d Radio Battalion. He has deployed in support of Operation Iraqi Freedom, Operation Enduring Freedom, and the 22d Marine Expeditionary Unit. Major Hart is a graduate of the Expeditionary Warfare School and Command and Staff College both at Marine Corps University.

Matthew Slater received his PhD from Old Dominion University and worked as a thesis advisor and instructor at the Marine Corps Command and Staff College. He was also a researcher, editor, and analyst for the Marine Corps, Army, and Joint Staff. He has edited two books published with Marine Corps University Press, *Patterns of Influence: Strategic Culture Case Studies and Conclusions* (2020), and the coedited volume *Considering Russia: Emergence of a Near Peer Competitor* (2017). During his career, he edited and authored numerous military concepts, operational analysis reports, doctrine, training, and policy documents and currently supports curriculum development at the FBI Academy.

Major Marianne C. Sparklin is a 2009 United States Naval Academy graduate. Following graduation, she was commissioned a second lieutenant in the United States Marine Corps. She was designated a naval aviator in 2012 and served as a Bell UH-1Y Huey helicopter pilot at Marine Light Attack Helicopter Squadron 469 in Camp Pendleton, California. As a UH-1Y pilot, she deployed on the 31st Marine Expeditionary Unit and the Unit Deployment Program. In 2015, she supported Operation Sahayogi Haat in Nepal, supporting humanitarian assistance/disaster relief operations. In 2018, she

reported to 1st Air Naval Gunfire Liaison Company as a forward air controller, where she attained the weapons and tactics instructor designation as an air officer. In 2020, she reported to Marine Corps University's Command and Staff College. At the Command and Staff College, she participated in the Gray Scholars Sea Power Strategy Program, completed her masters of military studies with a focus on Indo-Pacific geopolitics, and graduated as a distinguished graduate. This is her first publication.

The end of the Cold War in 1991 bought the United States more than two decades of global leadership and prosperity. Neorealist international relations theory correctly predicted that hegemony, although the most stable power arrangement, is doomed to deteriorate as rising competitors band together to challenge the existing world order. As the United States pivots from hegemony to competition, the Department of Defense is adjusting its capabilities to confront the Chinese Communist Party and the Russian oligarchy. The U.S. Marine Corps may be considered at the forefront of the rapidly changing force structure. These changes will not rely on the acquisition of new weapons systems for success. Instead, the capacity of Marines to accommodate new ways of thinking, norming chaotic processes, and adapt to dynamic operational environments will determine their outcome. This volume provides a window into how current and future Marine leaders will grapple with this historic challenge.

ABOUT THE EDITOR

Matthew Slater received his PhD from Old Dominion University and worked as a thesis advisor and instructor at the Marine Corps Command and Staff College. He was also a researcher, editor, and analyst for the Marine Corps, Army, and Joint Staff. He has edited two books published with Marine Corps University Press, *Patterns of Influence: Strategic Culture Case Studies and Conclusions* (2020), and the coedited volume *Considering Russia: Emergence of a Near Peer Competitor* (2017). During his career he edited and authored numerous military concepts, operational analysis reports, doctrine, training, and policy documents and currently supports curriculum development at the FBI Academy.

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