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The intended audience for this paper includes Navy and Marine Corps personnel developing or influencing the force development and resource prioritization to support the Corps' EABO concept. A significant effort was made to explain terms and definitions, but to a new reader on the topic some terminology may be unfamiliar. Of discussion are the Corps' responsibilities as a service and the inability of the Navy to currently meet the Corps' tactical naval logistic network requirements.

The research methodology utilized is of the scientific method by proposing a thesis and attempting to provide answers through observations and research. Professional journals, doctrinal publications, and wargaming results are utilized as anecdotal evidence. The specific objective is for the reader to achieve an understanding of current and future gaps that the tactical naval logistic network faces as it attempts to enable EABO.

The network shortfalls are not only a USMC concern, but also a USN concern; thus, it provides opportunities in which the Corps can provide more significant support to its naval brethren. The intent is to make decision-makers aware of the issue and begin the discussion because the impact cuts across several communities. Specific examples of gaps in the network and possible solutions are discussed to include actions the Corps can take to be a contributor to the system as the first step in developing a complementary tactical naval logistic network.

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**Lack of a Current Tactical Naval Logistic Network to
Enable Expeditionary Advance Base Operations**

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Executive Summary

Title: Lack of a Current Tactical Naval Logistic Network to Enable Expeditionary Advance Base Operations

Author: Major Kees Punter, United States Marine Corps

Thesis: The Marine Corps must take a more significant stance in developing and coordinating the tactical naval¹ logistic network to meet its service responsibilities due to Navy shortfalls in the network to realize the successful execution of the Expeditionary Advance Base Operations (EABO) concept.

Discussion: With the release of the 2018 National Defense Strategy (NDS), the military refocused its warfighting capabilities on great power competition. To focus the services, the Corps developed the EABO concept, and the Navy developed the Distributed Maritime Operations (DMO) concept. To enable the EABO and DMO concepts, a significant logistical network is required to support the fighting end units facing a peer competitor in a contested access environment.

Complicated by stagnating budget growth, the changing character of war requires prioritization of resources by both services to bring their concepts to realization. Though the concepts are complementary, each services' resource prioritization may not provide the believed support the other service was expecting. Specifically, the Corps continues to plan on the historical precedence of the Navy's logistical network to resupply Marine forces to the hightide mark wherever and whenever the Corps requires. Neither the Marine Corps or the Navy can provide the solutions or the resources to fix the entire tactical naval logistics network gap that exists for a force operating in a DMO and EABO environment. Each service will fail independently if the services do not seek solutions together.

Conclusion: The Corps must significantly contribute to the development of a tactical naval logistic network to enable EABO, as the economic system currently provided by the Navy is insufficient.

DISCLAIMER

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Abstract

The intended audience for this paper includes Navy and Marine Corps personnel developing or influencing the force development and resource prioritization to support the Corps' EABO concept. A significant effort was made to explain terms and definitions, but to a new reader on the topic some terminology may be unfamiliar. Of discussion are the Corps' responsibilities as a service and the inability of the Navy to currently meet the Corps' tactical naval logistic network requirements.

The research methodology utilized is of the scientific method by proposing a thesis and attempting to provide answers through observations and research. Professional journals, doctrinal publications, and wargaming results are utilized as anecdotal evidence. The specific objective is for the reader to achieve an understanding of current and future gaps that the tactical naval logistic network faces as it attempts to enable EABO.

The network shortfalls are not only a USMC concern, but also a USN concern; thus, it provides opportunities in which the Corps can provide more significant support to its naval brethren. The intent is to make decision-makers aware of the issue and begin the discussion because the impact cuts across several communities. Specific examples of gaps in the network and possible solutions are discussed to include actions the Corps can take to be a contributor to the system as the first step in developing a complementary tactical naval logistic network.

Problem Statement

The Expeditionary Advance Base Operations (EABO) concept cannot be supported with the current tactical naval logistics network and thus the network the Corps expects of the Navy for the future is not forthcoming. The 38th Commandant states “the Marine Corps is not organized, trained, equipped, or postured to meet the demands of the rapidly evolving future operating environment,” but at no point provides indications the current Navy logistical system faces the same challenges.² The Marine Corps’ EABO and Distributed Maritime Operations³ (DMO) both discuss an environment in which the United States utilizes infrastructure prioritized for streamlined and efficient force introduction located in allied nations. The focus of introducing military force through minimal nodal⁴ points allows the United States military to develop forces, equipment, and procedures that integrate and maximize the capabilities of the well-developed infrastructure. In return, the optimization and efficiency provided make these locations critical assets to military plans to field and sustain forward forces. With limited nodes able, and planned, to be utilized for conflict, the US makes it very easy for an enemy to develop counter plans. The enemy’s plans cover targeting, or even right-out denial of these nodes, affecting the US’ plans and capability. Developing the forces and equipment to integrate efficiency with the now targeted or denied infrastructure, the enemy has not only affected the entire line of communications⁵ but the whole warfighting force and its supporting infrastructure.

Both DMO and EABO were developed upon this realization calling for a different employment strategy of naval forces outside the few well-developed nodes. Does the Navy prioritize resources and structure in its reformatted force structure that enables a tactical naval logistic network outside historically established nodes, thus allowing for reliable supply? No, it does not.

Thesis: The Marine Corps must take a more significant stance in developing and coordinating the tactical naval logistic network to meet its service responsibilities due to Navy shortfalls in the network to realize the successful execution of the Expeditionary Advance Base Operations (EABO) concept.

The Corps undertook a force design⁶ review to restructure itself to meet the EABO concept, and as of the writing of this paper, is still waiting for it to be officially released. General Berger, (38th Commandant of the Marine Corps (CMC)), stated “what can Marines do to help the fleet commander fight his fleet? How does that contribute towards a joint fight? It could mean Marines ashore or afloat with longer-range anti-ship missiles; visualize them as an extension of the fleet’s magazine augmenting - in other words air and ship-based fires.”⁷ The scene setting the General and the EABO concept describe are small echelons of Marines operating in dispersed archipelago locations hundreds, if not thousands, of miles apart on Expeditionary Advance Bases (EABs) complicating enemy targeting acquisition and cost while providing massed fire effects for enhanced sea denial. In turn, this situation complicates the friendly tactical logistic network by thousands of miles that the Navy and Marine Corps now must develop to support these dispersed forces. With the Corps and the Navy changing their force structure to coincide with the changing character of war, can the Corps rely upon the Navy for its tactical logistical support in an EABO environment? The Navy’s priorities indicate that the Corps cannot.

The Navy’s Force Structure Assessment (FSA), now the Integrated Naval FSA (INFSA), was supposed to be released in late 2019, but continues to be delayed.⁸ The highest equipment priorities set for the Navy by the Secretary of the Navy and Chief of Naval Operations (CNO) with limited resources are the ballistic missile submarine (SSBN) Columbia program⁹ (Figure 1),

a 355 ship navy by 2030¹⁰, more investment in unmanned surface and subsurface ships¹¹, and delivering the USS Ford carrier in an operational state (Figure 2).¹² Visually via the Columbia and Ford respective Figures, the required resources for these initiatives is significant. In contrast, the Navy's resourcing for its logistic network is a pittance. The Navy is proposing to add only one more Combat Logistics Force (CLF) ship through 2048 even while planning to add over 50 more ships that the CLF must support.¹³

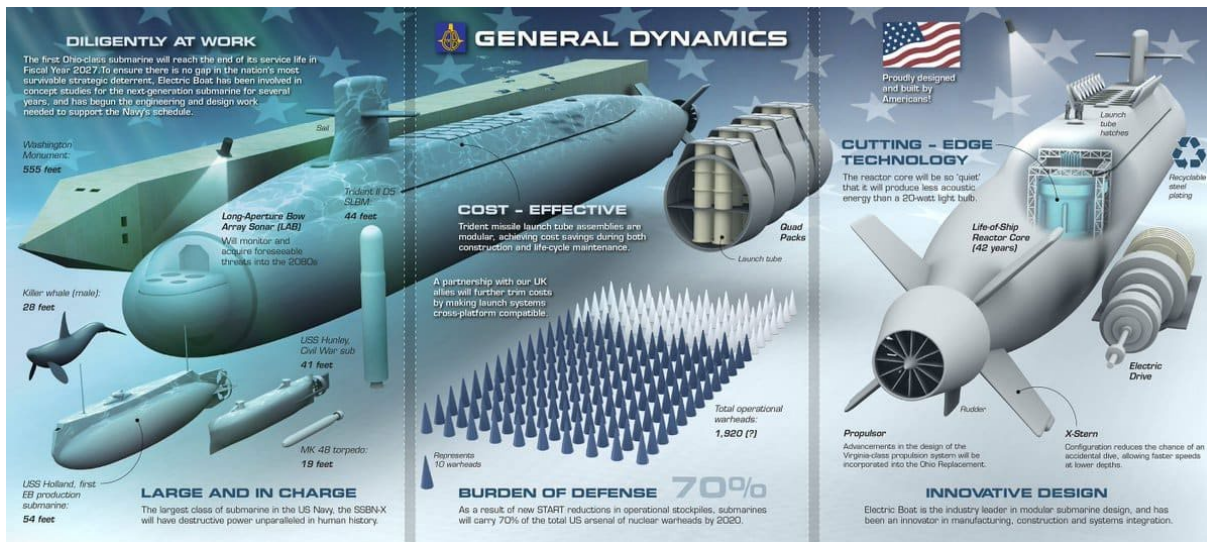


Figure 1: SSBN Columbia specifications.¹⁴

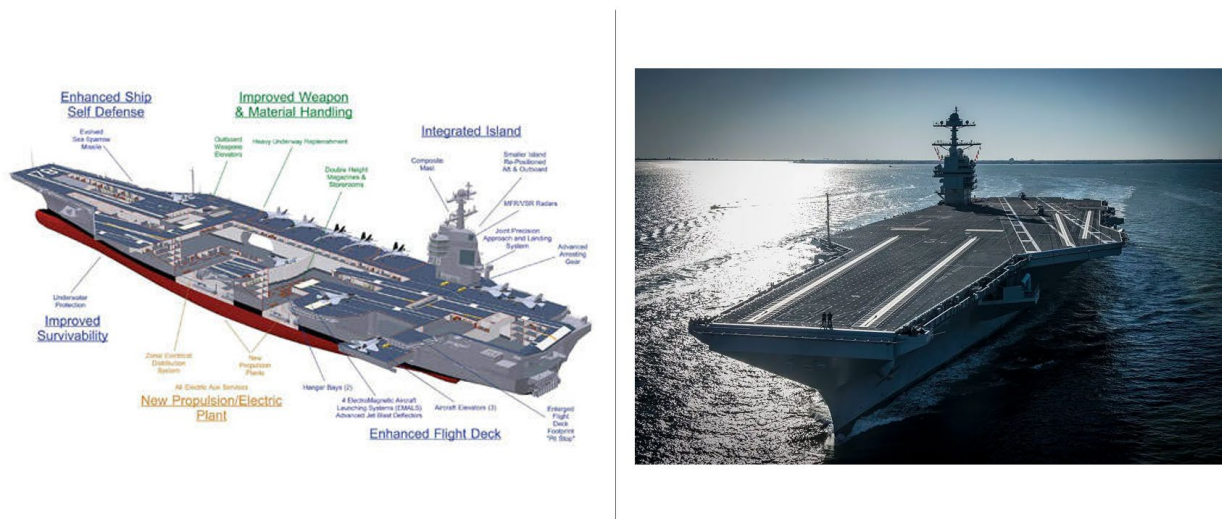


Figure 2: USS Gerald R. Ford aircraft carrier^{15 16}

The Navy and the Marine Corps' plans improperly resource the tactical naval logistic network¹⁷ capability required by their respective concepts. The network will have to sustain a widely dispersed naval force operating within the enemy's weapon engagement zone (WEZ) as an inside force away from the current lines of communication. Sourcing the processes and equipment is required as "sustainment is the pacing function for [the realistic execution of] EABO."¹⁸ If the Corps wants the EABO concept to function while "operate[ing] inside actively contested maritime spaces in support of fleet operations,"¹⁹ then the Corps must extend and enhance the tactical naval logistic network instead to enable the "action of the larger naval campaign."²⁰

Doctrinal Review of Corps' Responsibility

Joint Publication (JP) 4-0 states each service is responsible for logistically supporting their forces.²¹ A service's logistical operating system is comprised of the functional resources (people, systems, bases, etc.) and the procedures (orders and concepts) that integrate the functioning of the resources to support the service's force.²² The Marine Forces (MARFOR) component of each combatant command coordinates with and for Navy logistical operating system assets to support Marine Corps logistical requirements through already coordinated agreements and plans.²³ Logistical support required outside of available pre-established agreements is still the responsibility of the Corps to sustain its forces.

To attain its logistical sustainment requirements, each unit (O-5 level and above) in the Marine Air-Ground Task Force has an organic logistics capability. When a unit's logistical capability or capacity is exceeded, the logistics combat element (LCE) extends the required logistical need. The LCE supports MAGTF units by drawing upon theatre level logistics

capability and capacity coordinated through the MARFOR G-4 to other services at the operational level if not already planned through agreements.²⁴ If the MARFOR cannot organize the required logistical requirement, or the MAGTF does not already contain the needed resource, the responsibility still resides with the Corps to source the provision. The Corps must source the supply required if the demand remains valid or tell supported commanders, usually the geographical combatant commander (GCC), that the mission cannot be completed as tasked. The Corps should not tell supported commanders a mission cannot be completed except for infrequent instances since executing assigned tasks per Title 10 responsibilities is the reason the Corps exists. If the assigned mission was within the scope of the Corps' Title 10 responsibilities and was a required mission to complete with no other sustainable execution, the Corps would have to source the shortfall itself. The Corps is finding the requirement to logistically support its own forces in the face of a changing environment challenging.

The naval services understand the character of war and that the operational environment is changing while the United States' most likely competitors and possible enemies are peers. These factors, combined with stagnating budgets and aging service equipment sets, indicate to the naval services they must change, not only to operate, but win in this wicked problem. In the logistics warfighting function, the Secretary of the Navy sees the "need to transform naval logistics...to obtain greater efficiency and effectiveness in supporting the warfighter."²⁵ If the Navy cannot provide the change, the Corps, by doctrine, must.

Can the Corps Rely Upon the Navy for its Tactical Logistical Support in an EABO environment?

The United States Marine Corps and the United States Navy have had a close relationship since their establishment in 1775. Throughout history, the closeness and interoperability

between the two services has waxed and waned, especially at the time when the Corps was established as a separate service in 1978²⁶ and then reinforced by the Goldwater Act in 1986. Additionally, requirements for core and assigned missions drove the level of reliance and integration.

With the release of the CPG, the Commandant intends that the Fleet Marine Force (FMF) and the Corps will closer integrate and work for the fleet commanders in support of their operational needs. With the return to greater integration, the Corps' reliance on the Navy for its logistical support will become even more significant. EABO and DMO require Marine formations to operate in widely dispersed positions to provide fleet commanders survivable and useful capabilities. The Commandant identifies five reasons of why the Corps will conduct EABOs in a distributed manner.²⁷

- 1) Disperse to better accomplish the mission against a distant or distributed adversary.
- 2) Disperse to improve maneuver options in order to gain a positional advantage to assault, or engage more effectively with direct or indirect fires.
- 3) Disperse to reduce the effects of enemy fires.
- 4) Disperse to impose costs and induce uncertainty.
- 5) Disperse to reduce our signature to avoid detection. In a precision strike regime, sensing first and shooting first is a tremendous advantage.

To facilitate these actions, the Marine Corps, the Navy, and the Coast Guard are working to further the integration of the services. This initiative is called Naval Logistics Integration (NLI). When reviewing the NLI Handbook, it is clear the development of information and understanding to facilitate the functional resources (people and platforms) and processes between each service are occurring.²⁸ Further inferred from the handbook, it becomes apparent that the Marine Corps is the largest intended benefactor of the integration. The intended purpose was for all services to complement a tactical naval logistic network instead of focusing on facilitating

Marine operations from Navy capabilities. Even if the Handbook's real purpose is met, the question remains can the Navy support the Marine's tactical logistical requirements in an EABO environment? The current and forecasted capabilities indicated the Navy cannot provide the required support.

Current Logistical Platform Capacity

If the Corps is to rely upon the Navy's tactical logistics network to accomplish the objectives of EABO, then that network must be adequate to the mission. JP 4-0 provides seven principles for effective logistical support that the Navy would have to meet. The seven principles are *responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability*.²⁹ For the Corps to rely upon the Navy's tactical logistics network, the principles must be present within the system. Unfortunately, the Navy's network is not adequate. However, the Corps plans to significantly rely upon the Navy's Combat Logistics Fleet (CLF) as it is the Navy's primary connector at the tactical logistics level (a.k.a. the last tactical mile³⁰) to provide the Corps' logistical sustainment. Figure 3 shows the logistics distribution for a MEU with the CLF being the first non-organic store that the Corps taps into.

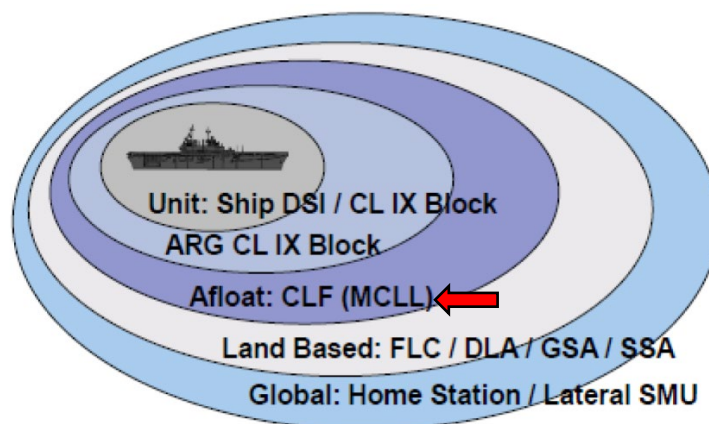


Figure 3: Logistics Sustainment Sourcing Model for the MEU.³¹

As depicted in Figure 3, the CLF is the critical sustainment connection capability between land based supplies and forward ships or EABs to enable a consistent, forward presence and unit operations without culminating.³²

Unfortunately, the required CLF support may not be available to the Corps to conduct EABO, as the Navy may have an issue supporting itself. A recent Congressional Research Service report concluded that “the Navy’s FY2020 30-year shipbuilding plan suggests that shifting to a more distributed fleet architecture could increase the required numbers of CLF ships—meaning the oilers, ammunition ships, and dry cargo ships that transport fuel, ammunition, and supplies to Navy combat ships that are operating at sea—and augment today’s CLF ships with additional smaller, faster, multi-mission transports.”³³ A study by the Center for Strategic and Budgetary Assessments estimated the Navy would require 143 CLF ships by 2048 to support the Navy Battle Fleet.³⁴ The Navy plan currently only resources 27 CLF ships (Figure 4) with an end strength of 31 (Figure 5) by the end of 2048. The Navy is replacing its significantly aged CLFs but not increasing the capacity that a more distributed force conducting EABO or DMO would require. The budget also makes no allowance for the “smaller, faster, multi-mission transports”³⁵ identified in the FY2020 shipbuilding plans. Due to this significant shortfall of a critically required capability, the Navy will not prioritize these limited resources for Corps use when the Navy requires them for itself. The shortfall retains this problem as a service requirement and problem. The Corps must realize the Navy’s decisions do not prioritize the Corps’ needs, much less the funds required to properly facilitate Corps operations.

FY	CVNs	LSCs	SSCs	SSNs	LPSs	SSBNs	AWSs	CLFs	Supt	Total
20	1	3	1	3				2	2	12
21		2	2	2				1	1	10
22		2	2	2				1	2	9
23		3	2	2				2	3	13
24		3	2	2				1	1	11
25		3	2	2				1	2	11
26		2	2	2				1	2	11
27		3	2	2				2	1	12
28	1	2	2	2				1	1	11
29		3	2	2				1	1	11
30		2	1	2				1	2	10
31		3	2	2				2	1	13
32	1	2	2	2				1	2	12
33		3	2	2				1	2	12
34		2	2	2				2		11
35		3	2	2					1	9
36	1	2	2	2						8
37		3	2	2						7
38		2	2	2						7
39		3	2	2						8
40	1	2	2	2						8
41		3	2	2						8
42		2	2	2						8
43		3	2	2						8
44	1	2	2	2						8
45		3	2	2				2	2	12
46		2	2	2				1	2	9
47		3	2	2				1	2	10
48	1	2	2	2				2	2	12
49		3	2	2				1	2	13
Total	7	76	58	61	5	12	28	27	30	304

Source: U.S. Navy, Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020, Table A2-1 on page 13.
Key: FY = Fiscal Year; CVNs = aircraft carriers; LSCs = surface combatants (i.e., cruisers and destroyers); SSCs = small surface combatants (i.e., Littoral Combat Ships [LCSs] and frigates [FFG(X)s]); SSNs = attack submarines; LPSs = large payload submarines; SSBNs = ballistic missile submarines; AWSs = amphibious warfare ships; CLFs = combat logistics force (i.e., resupply) ships; Supt = support ships.

Figure 4: FY2020 30-Year (FY2020-FY2049) Shipbuilding Plan³⁶

	CVNs	LSCs	SSCs	SSNs	SSGN/LPSs	SSBNs	AWSs	CLFs	Supt	Total
355-ship goal	12	104	52	66	0	12	38	32	39	355
FY20	11	94	30	52	4	14	33	29	34	301
FY21	11	92	33	53	4	14	34	30	34	305
FY22	11	93	33	52	4	14	34	31	39	311
FY23	11	95	32	51	4	14	35	31	41	314
FY24	11	94	35	47	4	14	36	32	41	314
FY25	10	95	35	44	4	14	37	32	42	313
FY26	10	96	36	44	2	14	38	31	43	314
FY27	9	100	38	42	1	13	37	32	44	316
FY28	10	102	41	42		13	38	32	44	322
FY29	10	104	43	44		12	36	32	44	325
FY30	10	107	45	46		11	36	32	44	331
FY31	10	110	47	48		11	36	32	43	337
FY32	10	112	49	49		11	36	32	44	343
FY33	10	115	50	51		11	38	32	44	351
FY34	10	117	52	53		11	36	32	44	355
FY35	10	114	55	54		11	34	32	45	355
FY36	10	109	57	56		11	35	32	45	355
FY37	10	107	58	58		10	35	32	45	355
FY38	10	108	59	57		10	35	32	44	355
FY39	10	105	61	58		10	37	32	42	355
FY40	9	105	62	59		10	37	32	41	355
FY41	10	104	61	59		11	37	32	41	355
FY42	9	106	60	61		12	36	32	39	355
FY43	9	108	57	61	1	12	36	32	39	355
FY44	9	109	55	62	1	12	36	32	39	355
FY45	10	107	55	63	1	12	36	32	39	355
FY46	9	106	54	64	2	12	37	32	39	355
FY47	9	107	54	65	2	12	35	32	39	355
FY48	9	109	51	66	2	12	35	32	39	355
FY49	10	108	50	67	3	12	35	31	39	355

Source: U.S. Navy, Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020, Table A2-4 on page 13.
Note: Figures for support ships include five JHSVs transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.
Key: FY = Fiscal Year; CVNs = aircraft carriers; LSCs = surface combatants (i.e., cruisers and destroyers); SSCs = small surface combatants (i.e., frigates, Littoral Combat Ships [LCSs], and mine warfare ships); SSNs = attack submarines; SSGNs/LPSs = cruise missile submarines/large payload submarines; SSBNs = ballistic missile submarines; AWSs = amphibious warfare ships; CLFs = combat logistics force (i.e., resupply) ships; Supt = support ships.

Figure 5: Projected Force Levels Resulting from FY2020 30-Year Shipbuilding Plan³⁷

The shortage of CLF ships the Navy faces for itself does not meet the effective logistic network principles of *responsiveness*, *flexibility*, *attainability*, or *sustainability* for the Corps to rely upon. Further evidence shows that CLF ships will have to provide organic security.³⁸ The risk to CLF is significant both within the enemy WEZs and outside the WEZ with China's Active Strategic Counterattacks on Exterior Lines, which targets military assets as they close the distance to the fight.³⁹ Either way, with no provided self-defense or provided escort, a CLF is not survivable. With five of seven logistic principles not met in the CLF, the primary facilitator for the tactical naval logistics network means it is not reliable for the Corps. These facts point to exactly the opposite truth. The Navy requires assistance from the Corps in developing a network that can realistically support both services.

As providing logistical support to other services is a non-typical Marine Corps mission, many Marine logisticians will state the Army can fill any gaps the Navy cannot provide. Specifically, that Army Theatre Sustainment Commands (TSC) sealift assets would make up any deficiency that the CLF could not meet. These statements are true...for many past conflicts. The Army also has tight resources and is eliminating 80% of its maritime operations capability. Eighteen of their 35 Land Craft Utility-2000 (LCU-2000) will retire along with all reserve Army naval assets with no intent to replace the support infrastructure or the surface platforms themselves.⁴⁰ These actions significantly reduce ocean-going connectors to TSCs and the ability to cover CLF gaps. With no relief in sight from the Army, the Corps has a service retained responsibility to facilitate a tactical naval logistic network if it wants to realistically enable EABO.

Communication Network

Assuming the physical movers of a network were adequate, signaling demand of the supplies required to be carried by the movers is just as critical. Acknowledging that all of the services are acting within constrained resources, many logisticians argue the Navy is pursuing progress where it can. As an example, the Navy has a \$10 million contract with Amazon Web Services (AWS) to move all logistic systems managing \$70 billion of services and parts into the cloud.⁴¹ This move improves connectivity and interaction between the Navy logistic systems and the Navy users themselves. Though the Navy tackled communication among its own logistics systems, this does nothing to ensure connectivity with Marine logistic systems. The Corps is also seeking to migrate its operations to the cloud for a more streamlined and assured connection; however, the Corps will not use the same cloud.⁴²

The Corps' current logistical system, the Global Combat Support System-Marine Corps (GCSS-MC), will be one of the operations migrated to the Corps' cloud function. One of the most substantial benefits of utilizing a cloud-based system is real-time updates.⁴³ Real-time updates will be a critical benefit for GCSS-MC due to its degraded operational status when in a deployed environment, even with dedicated communication architecture. When the opportunity for GCSS-MC to reestablish connectivity is available, the information provided will be in real-time. But there are still two significant concerns. One, GCSS-MC is not interoperable with the Navy's Enterprise Resource Planning (ERP)⁴⁴ system without substantial workarounds. These workarounds require considerable time and knowledge, and any bridging networks must also be functional to connect the two systems. The delicate connection naturally leads into the second concern; the current system servers for GCSS-MC, ERP, the bridging programs, and of course, the internet connections themselves, must all be working for the bridging capability to be operational. Whether a system component fails, a single system is down, the bridging solution is non-operable, or deliberate tampering has occurred (hacking or impact to satellite communication by enemies⁴⁵), numerous connection points must work correctly to facilitate the logistical network across the naval services. Migrating these systems to the cloud could possibly mitigate some of the potential pitfalls.

Without addressing assured communications, the best outcome would be to have ERP, GCSS-MC, and their bridging capabilities all on the same cloud, leaving the connection element as the primary pitfall. Since the system's current and future operations will operate from separate clouds in the future, there will continue to be the potential for pitfalls. The systems the Corps' utilize to establish and track logistical demands will face their own difficulties but will be even further complicated when seeking to integrate with the Navy. The current establishment is not

responsive, simple, flexible, and some would state not even *survivable* in a peer conflict. Each service is investing in rectifying the principle shortfalls, but are not coordinating together to attain an integrated tactical naval logistics network. These factors are another indicator of the Corps accepting the logistical network as provided when the Corps could take steps to strengthen and contribute to the overall capability of the network.

Manpower

Whether manning the CLF ships or service members establishing supply requirements, manpower is a significant contribution to a logistical network. Manpower is a significant limitation in the Navy's capability to provide a tactical naval logistics network for the Corps. The Navy and the Marine Corps are aggressively testing unmanned platforms to save on human resources costs and reduce risk to the force to include logistical capabilities. One possibility to bridge the gap of CLFs is to utilize large unmanned surface vehicles (LUSV) as replacements. Whether LUSVs are totally un-crewed or partially manned to retain maintenance and provide security, both options require the additional workforce to sustain and operate the craft.⁴⁶ Without any new manning requirements levied upon the Navy from the Corps, the Navy is short 11,000 sailors and will need about 50,000 for the desired 355 ship Navy of the future.⁴⁷ The Navy will not want to apply their resources or newly required workforce for platforms that are primarily for the Corps' use to conduct EABO.⁴⁸ It is another instance of relying upon the Navy for tactical logistics where it cannot meet the seven principles of effective logistics. In this case, the shortfalls are *responsiveness, flexibility, attainability, and sustainability*.

Three sections of a possible naval tactical logistics network covering both functional resources and procedures, which constitute a logistical operating system, were studied to identify

if the network provided by the Navy was feasible. In all three examples, the principles of an effective logistical support network (*responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability*) were absent or significantly degraded. These sections demonstrate that if the Corps expects or entirely depends upon the Navy to fill the Corps' tactical logistics network gaps, the Navy's gaps and resource shortfalls will prohibit the Corps from conducting EABO effectively. The Corps should expect to provide for some of its own tactical logistics network gaps. By doing so, the Marine Corps will have opportunities to address some of the Navy's current shortfalls, possibly facilitating a complete network, and fulfilling their service responsibilities. Addressing the deficiencies would not only enable the Corps to execute the EABO concept effectively, but also better support fleet commanders. Discussed in the next section are possible opportunities to unify a singular naval logistics network and actions to better support fleet commanders logistically.

Examples of Possible Corps' Contributions to the Network

Littoral Maneuver Platform

One critical asset that both the Corps and the Navy depend upon for their logistics is surface transport, primarily the CLF. As earlier discussed, the CLF faces capacity, manning, and security issues with future Navy resourcing and employment decisions. If the Corps were to provide (fund, crew, and operate) the "smaller, faster[, and] multi-mission transports" as recommended in numerous reports and studies, numerous endstates and capability gaps would be addressed (see Figure 6). When discussing the smaller, faster transports, the reference is usually referring to Offshore Support vessels (OSVs) due to their commercial availability, economical operations, and ability to be modified to meet specific military requirements (such as a helicopter

pad to handle all current variations in the Corps inventory). Additionally, most OSVs can operate in sea states five or higher⁴⁹, and due to their smaller size, are less likely to be targeted with enemy missiles. This creates a targeting dilemma for the enemy.⁵⁰ The platform depicted in Figure 6 is designed to travel 16 knots with a 300 ton payload or 15 knots with a 600 ton payload and with a range of 3,000 nautical miles. The operational range and sea state provide it an organic capability to range the first island chain from Guam unassisted. A specific family of OSVs, called a Stern Landing Vessel (SLV), can even beach and de-beach itself, enabling littoral mobility without additional connectors. Attempting to replace a CLF with a fleet of Corps sourced SLVs would be inefficient and imprudent, but could provide the “last tactical mile” of a naval tactical logistical network while keeping CLF ships out of an enemy’s WEZ. The SLV would fill gaps in both capacity and sourcing while also meeting organic service responsibilities.⁵¹



Figure 6: Examples of an OSV, specifically a version called a Stern Landing Vessel (SLV).⁵²

Though a missile might not be utilized to target an OSV or SLV, it does not mean the enemy won’t seek to impose a cost on these ships. As an example, no OSV or SLV will be able to stand against a People’s Liberation Army Navy (PLAN) warship, but within a semi-permissive environment will most likely face the People’s Armed Forces Maritime Militia (PAFMM). China’s “weaker forces tend to ramp up escalatory behavior... militia vessels tend to

behave more aggressively, while coast guard and military vessels tend to be more circumspect.”⁵³ Due to PAFMM’s aggressive nature, OSVs or SLVs could count on being engaged and challenged regularly. Combining the PAFMM with the People’s Armed Police (PAP) and China Coast Guard’s (CCG) fishery enforcement branch and Offshore Surveillance, Patrol, and Sovereignty enforcement craft, which employs guns from 14.5mm to 37mm regularly with a slight few employing 76mm, provide the Chinese a sufficient small boat threat to these smaller vessels without utilizing limited PLA assets. The SLV, depending upon the ship designation given as USS or USNS, need adequate armaments to provide for its necessary defense. The Navy already owns USNS OSVs with two 25mm weapons installed for special missions.⁵⁴ Mirroring this capability on proposed SLVs should be of no consequence and provides heavily relied upon assets with a level of organic protection against PAFMM, PAP, or CCG forces. SLVs providing self-defense eliminates the need for escorts, which the Navy has already indicated they will not be able to provide.

Wargaming analysis⁵⁵ of SLVs provide organic littoral mobility, an estimated five days of supply (DOS), and waterward security from direct support (DS) SLVs. The SLVs in DS of fire EABs are especially critical as missile armaments require constant contractor maintenance and cannot be stored in planned weapons caches due to environmental control concerns. These factors mean the missiles must be brought forward into the operating area from limited storage sites. During the wargame, the best mix of SLVs were two in DS of each fire EAB to meet rapid mobility requirements, two additional SLVs in general support of logistical EABs or FARP EABs movement as needed, and four additional SLVs in general support (GS) of resupply from either CLF or other logistical connections outside the WEZ. Considering two to three fire EABs, plus the other SLVs, totals for 12 SLVs for an O-6 led sized MAGTF executing EABO. Each

SLV requires a crew of 5 personnel⁵⁶ to operate with no addition of capability requirements beyond the original design from the manufacturer puts the total at 60 personnel compared to one CLF T-AKE ship with a crew of 129.⁵⁷ The SLV with its travel capability, storage capacity, and forward presence, bring both the forces and the armaments forward with an ability to sustain that the CLFs cannot.

	SLV	Army LCU-2000 ⁵⁸	CLF T-AKE ⁵⁹
Capacity	600 ton payload, one helicopter capability	350 ton	6,675 tons dry cargo, 1,716 tons refrigerated stores, 756,000 gal fuel, two helicopter capability
Length	197 ft	174 ft	689 ft
Speed	16 knots @ 300 tons/15 knots @ 600 tons	10 knots @ 350 tons	20 knots @ 41,000 tons
Crew	5 personnel	13 personnel	129 personnel
Range	3,000 nautical miles	6,500 nautical miles	14,000 nautical miles

Figure 7: VLS, Army LCU-2000, and CLF T-AKE capability and requirement comparison.

Many military professionals from the Corps and from the Navy will take issue with the proposal of Marines operating craft in the blue water domain. Marine leadership will have issues as it takes manpower away from other priorities. To the Navy, it is another service operating in the Navy's principle domain which it feels indicating the service can not accomplish tasks within an area which is the reason for its existence. Both services must place required operational needs that benefit both services before their respective service pride. Though all talk has been of the services integration, this is not a new novelty, but a return to the past. Navy Regulations, Paragraph 1047 directed Marine divisions (not the Marine Corps equivalent, but the Navy equivalent to a section) to provide gun crews, security detachments, and damage control teams aboard Navy ships.⁶⁰ These positions were not only critical, but required as there were not enough sailors available to accomplish all required tasks. There was even an instance of a Marine, Lt John Gamble, commanding a Navy ship in 1813.⁶¹ As a more recent example, the

Army has piloted their own surface craft in the LCU-2000 as discussed earlier. Though not the preferred plan by either service, the Corps procuring and operating platforms like the SLV fills critical shortfalls to provide Navy capabilities and in the end enable the attainment of dual service objectives.

The SLV and OSVs are platforms that can fill critical resupply and transportation shortfalls, but this is not the only niche they could fulfill. Partnering an OSV or SLV with other programs, such as the Littoral Explosive Obstacle Neutralization (LEON) system, would enable the crew to inspect potential landing sites without putting personnel ashore and thereby reduce the potential of striking maritime mines by screening travel routes. The LEON allows a direct feed from its sensors to the bridge of the ship, allowing for accurate and near real-time analysis instead of long delay sensing and interpretation in current MCM systems. These routes would be useful to both the SLVs and possible USS warships entering the area of operations.

Tactical Air Logistical Support

Sourcing SLVs/OSVs could be a critical form of the Corps “supporting the extension and enhancement of the tactical naval logistics network.” Still, there are other actions the Corps could undertake immediately to arrive at the same endstate. For example, utilizing the CH-53E Super Stallion (which can swing-load a max of 36,000 lbs. with a 540-mile range⁶²) or the MV-22 Osprey (with a swing-load max of 10,000 lbs. with a 57-mile range⁶³) the Corps could fly the full variant of missiles fired from the MK-41 vertical launch system (VLS) module (fires multiple Standard Missile variants, Vertical Launch Anti-Submarine Rocket, Evolved SEA SPARROW missiles, and Tomahawk missiles which is the heaviest at 3,300 lbs.^{64 65}) to the Navy battle fleet from logistical EABs.

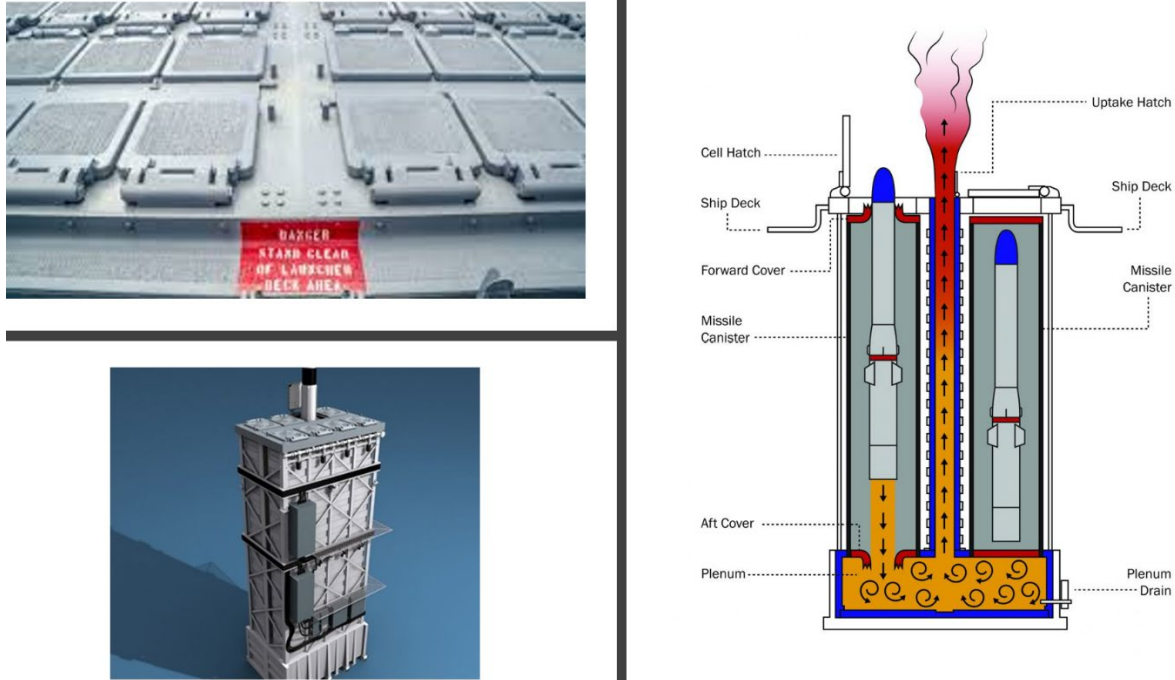


Figure 8: VLS Depiction. The top left shows the VLS from the ship deck perspective.⁶⁶ The bottom left shows a standard eight-cell VLS pack.⁶⁷ The right shows a diagram of VLS components.⁶⁸

Providing VLS module reloads from logistic EABs, via Marine aviation, to Navy USS warships working in concert with a ship's at sea VLS reload capability,⁶⁹ would allow ships to remain on station longer without having to withdrawal outside the WEZ. Of particular use is when a vessel has not extended its entire magazine, but the commander does not want to assume the risk of lessened striking power in a combat zone. The ship would not have to return to an established port outside of the WEZ only to refill half of the VLSs. This action requires no additional resources beyond process coordination with future Navy capabilities.



Figure 9: VLS Loading. The left side shows how VLS is currently reloaded in well-developed infrastructure ports.⁷⁰ The right shows one at sea VLS reload capabilities being tested.⁷¹

An action that the Corps could take in the process realm is to provide a sole source contract⁷² to Amazon Web Services (AWS) for its cloud services.⁷³ By using AWS and seeking to place the Corps' services on the same cloud as the Navy's, the logistical process would be simplified and potential for shortfalls reduced.

Described above are only a few actions the Corps can take to "support the extension and enhancement of the tactical naval logistics network" to fill Navy resource shortfalls and meet the Corps' service responsibilities. Some options require limited resources, while others are coordinating processes and need no other support. If the Corps undertakes the intent of these actions, then it will meet the Commandant's intention of "what can Marines do to help the fleet commander fight his fleet."⁷⁴

Conclusion

The Corps needs to more significantly invest in the tactical naval logistic network to facilitate the network it truly needs. The Navy is not prioritizing its resources to meet the Corps' desires and needs for logistical platforms, the appropriate communication network, or allotting of human resources thus reverting the logistical sustainment requirement to the Corps. If the Marine Corps expects to operate as described in the EABO concept, the service is obligated to provide the logistics to support the operations. While the Corps addresses the tactical naval logistic network gap, it also can support the fleet further by integrating the two services and developing a more significant effective combination. The Corps can provide tactical air logistical support and operate critical littoral maneuver platforms providing reduced demand and flexibility in employment to the Navy.

Neither the Marine Corps or the Navy can provide the solutions or the resources to fix the entire tactical naval logistics network gap that exists for a force operating in a DMO and EABO environment. Each service will fail independently if the services do not seek solutions together. As professionals, it is our responsibility to solve these problems while remembering “amateurs talk about tactics, but professionals study logistics.”⁷⁵

¹ The DOD Dictionary of Military and Associated Terms has no definition for “naval.” I define naval as the waterborne services to mean the Navy, Marine Corps, and Coast Guard.

² United States Marine Corps, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC, July 16, 2019), 1.

³ Chief of Naval Operations, *Navy Concept for Distributed Operations*, (Washington, DC, January 2019).

⁴ Chairman of the Joint Chiefs of Staff, “DOD Dictionary of Military and Associated Terms,” *jcs.mil/Doctrine*, January 2020, 154, <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf?ver=2020-01-24-100230-123>. Node — 1. A location in a mobility system where a movement requirement is originated, processed for onward movement, or terminated. (JP 3-17) 2. An element of a system that represents a person, place, or physical thing. (JP 3-0).

⁵ Chairman of the Joint Chiefs of Staff, “DOD Dictionary of Military and Associated Terms,” *jcs.mil/Doctrine*, January 2020, 131, <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf?ver=2020-01-24-100230-123>. Line of Communications — A route, either land, water, and/or air, that connects an operating military force with a base of operations and along which supplies and military forces move. Also called LOC.

⁶ General David H. Berger, “Notes on Designing The Marine Corps of the Future,” *marines.mil*, 6 December 2019, <https://www.marines.mil/News/News-Display/Article/2033629/notes-on-designing-the-marine-corps-of-the-future/>.

⁷ Megan Eckstein, “Berger: Marine 2030 Force Design Is Nearly Complete; Concepts Now Being Modeled, Tested,” *USNI.org*, 3 October 2019, <https://news.usni.org/2019/10/03/berger-marine-2030-force-design-is-nearly-complete-concepts-now-being-modeled-tested>.

⁸ Paul McLeary, "Navy Proposes Big Budget Cuts; Rep. Courtney Says It's DOA," *breakingdefense.com*, 10 February 2020, <https://breakingdefense.com/2020/02/navy-proposes-big-budget-cuts-rep-congressman-says-its-dead-on-arrival/>.

⁹ Congressional Research Service, "Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress," *fas.org*, 17 December 2019, Summary, <https://fas.org/sgp/crs/weapons/R41129.pdf>.

¹⁰ David B. Larter, "Acting US Navy secretary: Deliver me a 355-ship fleet by 2030," *defensenews.com*, 9 December 2019, <https://www.defensenews.com/naval/2019/12/09/acting-us-navy-secretary-deliver-me-a-355-ship-fleet-by-2030/>.

¹¹ Unmanned ships do not currently count toward the 355 ship goal.

¹² Chief of Naval Operations, *SECNAV Vector 1*, 6 December 2019, <https://www.secnav.navy.mil/donhr/Site/SECNAV%20Strategic%20Documents/SECNAV%20Memo%20Vector%2001.pdf>.

¹³ Larter. On average, four ships in the fleet are required to maintain one ship forward deployed; one of these being a CLF.

¹⁴ Congressional Research Service, "Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress," *fas.org*, 17 December 2019, Summary, <https://fas.org/sgp/crs/weapons/R41129.pdf>.

¹⁵ Modern Weapons, "GERALD R. FORD CLASS," *dmitryshulgin.com*, <http://www.dmitryshulgin.com/gerald-r-ford-class/>.

¹⁶ Arun Mathew, "USS Gerald R. Ford successfully completes acceptance trials, prepares for delivery," *defpost.org*, 28 May 2017, <https://defpost.com/uss-gerald-r-ford-successfully-completes-acceptance-trials-prepares-for-delivery/>.

¹⁷ The definition utilized for this paper of tactical naval (see footnote #6 for naval definition) logistics network is as follows drawn primarily from MCTP 4-12: Operational Logistics. Tactical naval logistics network: tactical naval logistics network encompasses the planning, coordination, and execution of the six functional areas of logistics (supply, maintenance, transportation, health services, general engineering, and services) within the organic logistic capabilities of a Marine air-ground task force (MAGTF), a numbered fleet capability, or combination thereof.

¹⁸ EABO, 14.

Congressional Research Service, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, 4 February 2020, 14, <https://fas.org/sgp/crs/weapons/RL32665.pdf>.

¹⁹ thenCPG, 1.

²⁰ CPG, 3.

²¹ Chairman of the Joint Chiefs of Staff, "Joint Publication (JP) 4-0: Joint Logistics Incorporating Change 1," *jcs.mil/Doctrine*, 8 May 2019, III-18, https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp4_0ch1.pdf?ver=2019-05-10-120259-860.

²² MCWP 4-1, 1-2.

²³ MCWP 4-1, 3-4.

²⁴ MCWP 4-1, 1-2.

²⁵ Department of the Navy, "SECNAV Instruction 4000.37B: Naval Logistics Integration (NLI)," 13 August 2018, <https://www.secnav.navy.mil/doni/Directives/04000%20Logistical%20Support%20and%20Services/04-00%20General%20Logistical%20Support/4000.37B.pdf>.

²⁶ Naval History and Heritage Command, "What's Going on with the Order of Service Flags?," *usnhistory.navylive.dodlive.mil*, 13 June 2016, <https://usnhistory.navylive.dodlive.mil/2016/06/13/whats-going-on-with-the-order-of-service-flags/>.

²⁷ CPG, 12.

²⁸ From the Handbook Department of the Navy, "NAVMC 4000.4A: Naval Logistics Integration (NLI) Handbook," 1 May 2019, <https://www.marines.mil/portals/1/Publications/MCO%205800.16%20Volume%204%20NLI%20Playbook.pdf?ver=2019-05-02-133829-403>.

²⁹ JP 4-0, I-8 to I-9.

³⁰ Last Tactical Mile: where strategic distribution ends and tactical distribution begins; from the ship, port or airfield and forward Defense Acquisition University, "Supply Chain and the "Last Tactical Mile,"" *dau.edu*, https://icatalog.dau.edu/mobile/CLL037/DAU_Supply_Chain_Atlas/010125/010125000060.html.

³¹ Headquarters, U.S. Marine Corps Logistics Plans, Policies, And Strategic Mobility, Office of The Chief Of Naval Operations Logistics Programs And Corporate Operations (N41), Headquarters, U.S. Coast Guard Engineering And

Logistics (CG-4), “Naval Logistics Integration (NLI) Playbook,” 1 May 2019, 4-3, <https://www.marines.mil/portals/1/Publications/MCO%205800.16%20Volume%204%20NLI%20Playbook.pdf?ver=2019-05-02-133829-403>.

³² Chairman of the Joint Chiefs of Staff, “DOD Dictionary of Military and Associated Terms,” *jcs.mil/Doctrine*, January 2020, 61, <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf?ver=2020-01-24-100230-123>. Culmination-The point at which a force no longer has the capability to continue its form of operations, offense or defense.

³³ Congressional Research Service, “Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress,” *fas.org*, 4 February 2020, 14, <https://fas.org/sgp/crs/weapons/RL32665.pdf>.

³⁴ United States Naval Institution, “Study Says Navy Logistics Fleet Would Fall Short in High-End Fight,” *USNI.org*, 17 May 2019, <https://news.usni.org/2019/05/17/study-says-navy-logistics-fleet-would-fall-short-in-high-end-fight>.

³⁵ Congressional Research Service, 14.

³⁶ Center for Strategic and Budgetary Assessment (CSBA), “Sustaining the Fight: Resilient Maritime Logistics for a New Era,” *csbaonline.org*, 23 April 2019, <https://csbaonline.org/research/publications/sustaining-the-fight-resilient-maritime-logistics-for-a-new-era>.

³⁷ Ibid.

³⁸ David B. Larter, “‘You’re on your own’: US sealift can’t count on Navy escorts in the next big war,” *defensenews.com*, 10 October 2018, <https://www.defensenews.com/naval/2018/10/10/youre-on-your-own-us-sealift-count-on-us-navy-escorts-in-the-next-big-war-forcing-changes/>.

³⁹ CSBA, 14.

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⁴³ Editor’s Choice, “Top 10 benefits of cloud computing,” *information-age.com*, 23 January 2020, <https://www.information-age.com/top-10-benefits-cloud-computing-123467995/>.

⁴⁴ Navy ERP is an integrated business management capability that modernizes and standardizes Navy business operations, provides unprecedented management visibility across the enterprise, and increases the effectiveness and efficiency of the Navy’s support for the warfighter. Assistant Secretary Of The Navy For Research, Development & Acquisition, “Navy ERP Enterprise Resource Planning Program,” *secnav.navy.mil*, <https://www.secnav.navy.mil/rda/Pages/Programs/ERP.aspx>.

⁴⁵ Defense Intelligence Agency, “Challenges to Security in Space,” *dia.com*, January 2019, 20 and 28, https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Space_Threat_V14_020119_sm.pdf.

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⁵¹ In attendance at force design wargames, 12-14 SLVs were required to support a Marine Littoral Regiment.

⁵² Ibid.

⁵³ Erickson, Andrew S. and Ryan D. Martinson, ed., *China’s Maritime Gray Zone Operations* (Annapolis, MD: Naval Institute Press, 2019), 26.

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