Preparing the INDO-PACOM AOR for Adaptive Basing: Logistics & Sustainment

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14. ABSTRACT

Without an asymmetric advantage in factors space, time, and force, the United States will need to adjust its operating procedures away from consolidation and efficiency and begin to operate in a more adaptive, less targetable manner. The concept of Adaptive Basing lessens the reliance upon legacy bases, fixed infrastructure, and large targetable platforms. The smaller size and greater number of bases create many complex issues with logistics and sustainment. For the Adaptive Base concept to succeed, the Combatant Commander (CCDR) must direct changes to logistics and sustainment systems well before hostilities begin. To ensure success, the CCDR must direct logistics and sustainment changes to ready forces to operate from Adaptive Bases. These changes include signaling the need for forces to be prepared to operate from Adaptive Bases with less infrastructure, instilling a more modular logistics construct, update sustainment system tools and computers, integrate Sea Basing with Adaptive Basing, and seek innovative future sustainment methods. Without the focus of planners and resources to these foundational pre-kinetic underpinnings, the Adaptive Base concept is unlikely to survive contact with the enemy.

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Logistics, Sustainment, Adaptive Basing, Agile Combat Employment, Agile Combat Support, Pacific

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INTRODUCTION

The National Defense Strategy names China as an emerging long-term strategic competitor who seeks to destabilize the United States' national security.[1] For this reason, the Pacific Theater, and specifically the South China Seas, are the current focus of military planners and wargamers. The vast space of the theater creates many challenges geographically while more sophisticated long-range weapons threaten the handful of power projection sites currently in use by the United States. The concept of Adaptive Basing, which is paralleled in purpose by Agile Combat Support (ACS) and Agile Combat Employment (ACE), is to posture survivable, combat credible capabilities within key maritime areas and operate inside the adversaries weapon engagement zone (WEZ).[2] The purpose of this construct is to enhance survivability, give the ability to seize the initiative, deliver lethal force with operational unpredictability, and succeed in a contested, degraded, and operationally limited (CDO) environment.[3] In combination with traditional basing, Adaptive Basing increases deterrence[4] and operational resilience.

This paper will give a short overview of Adaptive Basing and then discuss the crucial planning areas leading up to its employment. Most publications on Adaptive Basing, ACS, and ACE focus on the operational abilities and advantages of the concept. This paper will argue that

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[1] U.S. Office of the Secretary of Defense. *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge* (Washington, D.C.: Department of Defense, January 2018), 2-3.

[2] John Berry, USMC. "What's in a Name?" *Marine Corps Gazette*, 104, No. 2. February 2020): 14, accessed 21 March 2021, ProQuest.

[3] U.S. Department of the Air Force, *Air Force Role in Joint All-Domain Operations (JADO): Protection*, Air Force Doctrine Publication AFDP 3-99 (Maxwell, AL: Department of the Air Force, 2020), 2. https://www.doctrine.af.mil/Doctrine-Publications/AFDP-3-99-DAF-Role-in-Jt-All-Domain-Ops-JADO/

[4] This paper does not go in depth about Adaptive Basing as a deterrent, but it is worth noting Senator Jim Inhofe's and Senator Jack Reed's very poignant point with respect to Adaptive Basing as a deterrent in their published Pacific Deterrence Initiative (PDI). "A well-distributed posture will complicate Chinese targeting of U.S. forces and infrastructure. More capable missile defenses at American bases will make them more difficult and costly to strike. Greater numbers of combat-credible U.S. forces in the Indo-Pacific will make it harder for China to seize and maintain the advantage early in a conflict. More resilient logistics will make it harder to take U.S. forces out of the fight or delay reinforcements. New land-based, long-range strike capabilities will provide a new source of resilient and survivable U.S. power projection. The Pacific Deterrence Initiative will focus resources on these efforts and others with the aim of injecting uncertainty and risk into Beijing's calculus, leaving just one conclusion: "Not today. You, militarily, cannot win it, so don't even try it."

without adequate planning and attention to logistics and sustainment, the Adaptive Basing concept will fail. To ensure success, the Combatant Commander (CCDR) must direct changes in logistics and sustainment before the operational employment of forces from Adaptive Bases. These changes include signaling the capability requirement of forces to operate from Adaptive Bases and instilling a more modular logistics construct. Regarding sustainment, the CCDR must also update sustainment system tools and computers, integrate Sea Basing with Adaptive Basing, and seek innovative future sustainment methods. Implementing these recommendations will allow the formulation of Adaptive Bases and give the ability to sustain them in a contested environment. Without the focus of planners and resources to these foundational pre-kinetic underpinnings, the Adaptive Base concept is unlikely to survive contact with the enemy.

How Did We Get Here

Since the end of the Cold War, the United States military has enjoyed a dominant asymmetric advantage against less powerful adversaries. A large military force was unnecessary without a peer competitor, causing a drawdown of forces and cost-saving consolidation of bases. Within the United States, a 2005 Base Realignment and Closure (BRAC) Commission recommended to the President 182 closures or realignments with budgetary savings estimated to be $47.8 billion over 20 years.[5] Another purpose of this realignment was to cut redundancy and promote jointness throughout the force. From these standpoints, and with no foreseeable peer competitor, the consolidation of resources and geographic locations moved forward. These consolidation efforts affected U.S. military forces worldwide, and a culture of cost-saving and belt-tightening grew. After three decades, this culture has resulted in fewer U.S. bases and ports around the world.

[5] Anthony J. Principi, et al., *Defense Base Realignment Commission: Report to the President* (Arlington, VA: September 2005), iii. https://www.acq.osd.mil/brac/docs/BRAC-2005-Commission-Report.pdf

Today, the United States has again entered a period of great power competition with near-peer competitors having near equal weaponry and maneuverability. As China increases its military might, projecting a 400-battleship force by 2025,[6] the United States no longer enjoys an asymmetrical advantage and recognizes the limitations caused by a geographically smaller force. Even before the United States identified China and Russia as near-peer competitors, leaders in the Department of Defense understood the years of consolidations and realignments would impede the force's ability to support the needs of a growing variety of scenarios in diverse locations.

For this reason, the Air Force leadership commissioned a RAND report to study ACS in 2012 & 2020, and the Marines published their version of the concept in an Expeditionary Advanced Base Operations (EABO) Handbook in 2018.[7] [8] The U.S. military is transitioning from fighting the War on Terror against primarily non-state actors back to competing against large powerful nation-states which necessitates changing how they fight, deploy, and base their forces.

Adaptive Basing moves away from the U.S. reliance upon legacy bases, fixed infrastructure, and large targetable platforms. The concept creates an alternative forward-leaning force posture that utilizes smaller deployed units with less infrastructure dispersed throughout the AOR. The smaller size and greater number of bases also make them more difficult to target.[9] The operational art of Adaptive Basing incorporates a properly established theater-basing and lay

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[6] U.S. Library of Congress, Congressional Research Service. *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress,* RL33153 (Washington, D.C.: Congressional Research Service, March 2021), 2.

[7] Robert S. Tripp, Kristin F. Lynch, John G. Drew, Robert G. DeFeo, *Improving Air Force Command and Control Through Enhanced Agile Combat Support Planning, Execution, Monitoring, and Control Processes*, RAND Report A-571950 (Santa Monica, CA: RAND, 2014).

[8] Deputy Commandant of the Marine Corps, *Expeditionary Advanced Base Operations (EABO) Handbook*, (Quantico, VA: Marine Corps Warfighting Lab, Concepts and Integration Division, June 2018).

[9] Deputy Commandant of the Marine Corps, *Expeditionary Advanced Base Operations (EABO) Handbook*, (Quantico, VA: Marine Corps Warfighting Lab, Concepts and Integration Division, June 2018), 5.

down, sustainment of forces, and focus of using traditional and adaptive strategies varying from site to site and campaign to campaign to extend survivability.[10] To operate and sustain this new construct, the CCDR needs to focus on logistics and sustainment.

Logistics and Sustainment

Spreading Out and Forming Bases

Logistics is the planning and executing of movement and support of forces and is an integral part of providing and sustaining operational readiness.[11] The Adaptive Base concept relies heavily upon being able to move forces and equipment around the AOR. Having numerous smaller bases sprinkled around the Pacific islands to defend and project power begins to offer solutions to contend against the problem sets in the South China Seas. But it also brings more complexity to how the U.S. will be required to move forces and equipment amongst a dispersed network of Adaptive Bases and exposes the difficulties of the current logistical construct. Moving a wrench, radio, or spare tire from a large warehouse to the front lines is currently cumbersome at best and unnecessarily difficult.

The INDO-PACOM CCDR should reshape the logistical system within the AOR to support Adaptive Basing. The Indo-Pacific Strategy Report lays out the need to forward posture combat-ready and combat-credible forces and includes a list of initiatives and key investments required to contend with China as a competitor.[12] However, the report fails to address the improvements needed for logistical underpinnings to get the stated assets into and around the

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[10] Patrick Mills, et al., *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts*, RAND Report RR-4200-AF (Santa Monica, CA: RAND, April 2020), 2.

[11] Chairman, U.S. Joint Chiefs of Staff, *Joint Logistics*, Joint Publication (JP) 4-0 (Washington, D.C.: CJCS, May 2013), I-1. Quoted in James Gannon. "Naval Logistics Primer." NWC 1218A (Newport, RI: Naval War College, Joint Military Operations Department, January 2019), 1.

[12] U.S. Department of Defense, *Indo-Pacific Strategy Report: Preparedness, Partnerships, and Promoting a Networked Region* (Washington, D.C.: Department of Defense, June 2019), 18. https://media.defense.gov/2019/Jul/01/2002152311/-1/-1/1/DEPARTMENT-OF-DEFENSE-INDO-PACIFIC-STRATEGY-REPORT-2019.PDF

theater. To enact these changes, the CCDR should emphasize the capability need of operating from Adaptive Bases and institute a modular logistical construct.

Operate with Smaller Footprints

The CCDR needs to signal and communicate a capability need for forces to proficiently conduct operations from an Adaptive Base position. The past era of consolidation has led to a misconception of expeditionary bases being large and bloated facilities that require high levels of infrastructure, support, and comforts. Bases in Afghanistan, for example, include name-brand restaurants and MWR tents with yoga classes. The fundamental notion of what constitutes a 'base' and how forces operate from it must change to adapt to a new theater and new competitor.

Joint Publication 4-04 designates Adaptive Bases as Contingency Locations (CLs), which can also be labeled: base camps, forward operating bases, patrol bases, or combat outposts.[13] [14] Combat forces must understand an Adaptive Base is an integrated node in a network of bases that allows flexible operations to scale up and down rapidly to support maneuverable forces.[15] All service branches need to incorporate training that enables personnel to operate from Adaptive Bases in CDO environments. A clear message of required capabilities from the CCDR to all Service Chiefs will aid the individual service components to coalesce around a common viewpoint and train toward competencies needed to use adaptive facilities. The training focused on Adaptive Basing will also aid services in realizing a need for a refined modular logistics structure.

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[13] Chairman, U.S. Joint Chiefs of Staff, *Contingency Basing*, Joint Publication (JP) 4-04 (Washington, D.C.: CJCS, May 2019), viii. https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp4_04.pdf?ver=2019-03-12-145838-887

[14] For the purposes of this paper, Adaptive Base will used to designate the CCDRs CLs.

[15] Patrick Mills, et al., *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts*, RAND Report RR-4200-AF (Santa Monica, CA: RAND, April 2020), 64.

Modular Logistics Construct

The CCDR needs to direct the usage of a modular logistics construct within the AOR to pare down the size of deployment packages to support an Adaptive Base's specific objectives. This directive will steer the restructuring of how individual services shape deployment packages. An Adaptive Base functions differently from a traditional base and will have differing and more complex logistical needs. A modular logistical construct more fully refines personnel, parts, and abilities required for an objective and matches them with the minimal amount of force footprint needed. Current expeditionary deployment packages are geared for more controlled and built-up environments like Afghanistan or crisis response scenarios and have, over time, become all-inclusive and bloated.

The Air Force system, for example, uses a Unit Type Code (UTC) for expeditionary units. When the CCDR conveys a requirement, a pre-programmed UTC is set against the requirement and includes the entire support footprint. The UTC identifies a predefined standardized grouping of manpower or equipment for specific wartime capabilities.[16] Suppose the CCDR requires the ability to airdrop supplies. In that case, this will generate a UTC that includes cargo aircraft, which then requires an entire aircraft-specific maintenance suite, which requires airfield security personnel, adds refueling teams, and then adds logisticians for parts and supplies movement, etc. Instead of ordering all these capabilities separately, they are all bunched together under an ever-expanding UTC. The current pre-programmed UTC is not conducive to Adaptive Basing nor sharing of joint assets and capabilities. An Adaptive Base can support various aircraft that airman, sailors, or marines could refuel if trained on multi-airframe refueling, thereby eliminating a portion of an Air Force UTC package. A modular logistical

[16] Robert S. Tripp, Kristin F. Lynch, John G. Drew, Robert G. DeFeo, *Improving Air Force Command and Control Through Enhanced Agile Combat Support Planning, Execution, Monitoring, and Control Processes*, RAND Report A-571950 (Santa Monica, CA: RAND, 2014), 17.

system can up/downscale required skill sets to only those necessary personnel and equipment to complete the specific objective of an Adaptive Base.

A sticking point with restructuring an entire logistical operating system is the point of ownership. Each service is responsible for its logistical responsibility and, in so doing, operates differently. To encourage the integration of joint operations, the CCDR should enact their Direct Authority for Logistics (DAFL) to designate one service as a lead for integration.[17] DAFL authority is not indefinite and only covers a specific period of time to address gaps in operational support, which Adaptive Basing meets that intent. DAFL could be an instigating method to steer change and facilitate discussion between the CCDR, the USTRANSCOM commander, and Defense Logistics Agency (DLA). These discussions could be the impetus of joint doctrinal development at the CJCS level, a ground-up needs-driven approach.

Sustaining the Fight with Traditional and Innovative Measures

Sustainment is the provision of personnel, logistics, and other support required to maintain operations until the mission's successful accomplishment.[18] Once Adaptive Bases are stood up and functioning, they must be sustained to survive and deliver their commitment to lethality. The current systems used to ensure sustainment is antiquated and cumbersome to support a network of agile maneuvering bases that rapidly scale up and down in size. To make the sustainment system more reactive and agile, the CCDR should focus on updating sustainment systems tools, integrate the combat capability of Sea Basing into Adaptive Basing, and seek innovative future sustainment delivery methods.

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[17] James Gannon. "Naval Logistics Primer." NWC 1218A (Newport, RI: Naval War College, Joint Military Operations Department, January 2019), 7.

[18] Chairman, U.S. Joint Chiefs of Staff, *Joint Logistics*, Joint Publication (JP) 4-0 (Washington, D.C.: CJCS, May 2013), I-1. Quoted in James Gannon. "Naval Logistics Primer." (Newport, RI: Naval War College, Joint Military Operations Department, January 2019), 1.

Updating Sustainment Systems

The CCDR needs to attribute more funding and focus on updating logistical and sustainment network systems, computers, and software. These improvements would reduce the workload on theater logisticians and increase efficiency with automation of distribution planning. In Joint All-Domain Operations (JADO), lower echelon units should see and share sustainment and logistical information, enabling integrated planning and enhancing risk identification and mitigation.[19] By updating computers and software, the sustainment chain will no longer have to be stove-piped and linear. (Annex Figures 1 & 2) It can be a nodal network that is more responsive to the increased needs of numerous smaller bases and can circumvent hiccups or roadblocks which slow down linear supply chains.

General CQ Brown, previous PACAF commander and current Air Force Chief of Staff, refined what he described as the 'Amazon Prime Concept.' This concept integrates artificial intelligence (AI) technology with USAF planners to aid in predicting when certain parts would fail or how much fuel and food troops would need based upon their deployed location and operational duties.[20] The use of AI and an Amazon distribution network model would improve the efficiency of finding, tracking, and sending sustainment items across the AOR.

Instead of having an equal number of parts located at each Adaptive Base or having a large single-point-of-failure targetable warehouse, the Amazon network model distributes and accurately tracks parts throughout the entire sustainment network. Lateral supply moves, which transfer items between operating locations rather than from a central depot, reduce the redundancy and costs of Adaptive Basing while increasing survivability and efficiency rates of

[19] U.S. Department of the Air Force, *Air Force Role in Joint All-Domain Operations (JADO): Sustainment*, Air Force Doctrine Publication AFDP 3-99 (Maxwell, AL: Department of the Air Force, 2020), 1. https://www.doctrine.af.mil/Doctrine-Publications/AFDP-3-99-DAF-Role-in-Jt-All-Domain-Ops-JADO/

[20] Jennifer Hlad and Amy McCullough, "ACE-ing the Test," *Air Force Magazine* 01 May 2020, accessed 20 April 2021, https://www.airforcemag.com/article/ace-ing-the-test/

equipment.[21] The Air Force currently employs a system capable of making lateral supply moves, but it needs to be integrated for joint force use to maximize Adaptive Basing. Doing so would allow an Army supply troop, for example, to locate and acquire spare parts for a Marine comm troop at a joint-imbedded Adaptive Base.

Integrate Sea Basing with Adaptive Basing

The CCDR should integrate the combat capability of Sea Basing with Adaptive Basing. Sea Basing utilizes U.S. Navy amphibious category ships and Maritime Prepositioning Force (MPF) ships to stage forces at sea and conduct expeditionary operations ashore with little to no reliance on nearby land forces.[22] [23] (Annex Figure 3) This integration would improve maneuverability, increase sustainment options, and give the CCDR the ability to rapidly project power from both sea and land. Sea Basing enhances Adaptive Basing and must be diligently preplanned and given dedicated resources by the CCDR. A sea base is an inherently maneuverable, scalable aggregation of distributed, networked platforms that enable the global power projection of offensive and defensive forces from the sea.[24] The amphibious category ships used for Sea Basing are ideal for operating in the INDO-PACOM AOR and are projected to increase in number as part of the U.S. Navy's ship procurement plans.

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[21] Patrick Mills, et al., *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts*, RAND Report RR-4200-AF (Santa Monica, CA: RAND, April 2020), 27.

[22] Ronald O'Rourke, *Navy-Marine Corps Amphibious and Maritime Prepositioning Ship Programs: Background and Oversight Issues for Congress,* RL32513 (Washington, D.C.: Congressional Research Service, July 2007), 1.

[23] The MPF concept permits a MEB-sized Marine force to be established in a distant operating area more quickly than would be possible if the MEB's equipment and supplies had to be transported all the way from the United States. Unlike prepositioning of equipment and supplies on the soil of foreign countries, maritime prepositioning in international waters does not require permanent host nation access. The MPF concept also provides a degree of inter-theater operational flexibility, since an MPF squadron can be moved from one theater (e.g., the Mediterranean) to an adjoining theater (e.g., the Indian Ocean) relatively quickly if needed to respond to a contingency.

[24] Jose Gonzalez, "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." Research paper (Quantico, VA: USMC Command and Staff College, 2013), 26. Accessed 22 April 2021. https://apps.dtic.mil/sti/pdfs/ADA601780.pdf

Military authors have been discussing the concept of Sea Basing in naval doctrine for over seven decades. The time for its implementation is now as its capabilities aptly complement and support Adaptive Basing measures. The U.S. military has greatly increased its ability to operate jointly, and Sea Basing capitalizes on that joint integration. It offers more agility and maneuverability of all services within the AOR and thereby provides more options of forces to the CCDR.

Sea Base ships serve as amphibious ports at sea to either host a small unit base or act as nodal logistical hubs tied into the lateral distribution networks mentioned above. The ships could also serve as floating Amazon fulfillment centers to deliver personnel and equipment while simultaneously hosting a Marine Expeditionary Unit (MEU). The versatility, flexibility, and maneuverability of Adaptive Bases and Sea Bases go seamlessly together and positively reinforce each other. Both concepts distribute the force over a larger area, offering a wider array for sensors, C2, and payloads. (Annex Figure 4) Covering a larger area with the ability to transit between them positively influences the effects of factors time-space with innovative solutions, which the CCDR should continuously seek.

Innovative Future Sustainment Methods

To further enhance the future of force sustainment, the CCDR needs to seek, support, and integrate innovations for sustainment and delivery methods. The WWII Pacific Theater provides many examples of the importance and difficulties of force sustainment. The same factors of time, space, force hurdles still exist today but are more complex due to technological developments in transportation and weapon sophistication. Sustainment methods should advance in step with other methods of war. Two innovative systems of note are unmanned maritime vessels and reusable rocket resupply.

Unmanned Surface Vessels (USVs) offer solutions in logistics, sustainment, ISR, fires, C2, and many other areas. They are currently under development and will need to be integrated into the fleet. (Annex Figures 5 & 6) USVs are low-cost, high-endurance, reconfigurable ships that can accommodate various payloads while being operated remotely, semi-autonomously, or (with technological advancements) autonomously.[25] By incorporating this emerging technology with Adaptive and Sea Basing, autonomous MPF ships could standby for months harboring pre-staged supplies and equipment and then deliver those supplies on-demand to remote locations. The possibilities for employment further increase with added technologies of low observable architecture and self-defending capabilities.

For the fastest sustainment delivery and resupplies, reusable rockets are a not-too-distant viable option. SpaceX is working with USTRANSCOM to find the most rapid delivery capabilities of cargo. The possibility of using the Starship vertical landing vehicle could deliver the cargo capacity of a C-17 transport aircraft anywhere in the world in less than an hour.[26] Although this delivery method is currently cost-prohibitive and configured for large payloads, further proliferation of rocket usage would decrease costs. Varying size rockets could resupply both large traditional bases and small team adaptive bases on remote islands, thereby securing sea lines of communications in CDO environments to sustain the force.

CONCLUSIONS and RECOMMENDATIONS

In a military power competition against China, the United States may seem at a disadvantage due to the post-Cold War consolidation of forces, decades of fighting the Global

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[25] U.S. Library of Congress, Congressional Research Service. *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress,* R45757 (Washington, D.C.: Congressional Research Service, March 2021), 1. https://fas.org/sgp/crs/weapons/R45757.pdf

[26] Sandra Erwin, "U.S. Transportation Command to Study Use of SpaceX Rockets to Move Cargo Around the World," *Space News* , 07 October 2020, accessed 04 April 2021, https://spacenews.com/u-s-transportation-command-to-study-use-of-spacex-rockets-to-move-cargo-around-the-world

War on Terror, and an increasing number of mission tasks with a decreasing military force. But from these perceived disadvantages come strengths. The rounds of BRAC brought forces together and caused the military to become more jointly integrated and learn how to coordinate and operate with a unity of effort. Decades of contingency operations have kept swords sharp and refined tactics, techniques, and procedures of weapon employment to stay battle-hardened. And having more requirements and missions than personnel to complete them has propelled innovation and creativity. These strengths will aid U.S. forces to be successful in the Pacific Theater once again.

The enormity of the Pacific Theater draws out lines of communication. Much like being stuck on thin ice, the way to survive is to distribute your weight over a larger surface area. Similarly, the U.S. should spread out and decrease the size of the theater by using smaller Adaptive Bases in more locations. Enabling these bases to communicate and distribute equipment throughout their interconnected network decreases the amount of time they would have to wait for reinforcements and resupply.

Adaptive Basing allows the United States to operate effectively and with lethality in the Pacific Theater. The concept is designed to enhance survivability, deliver lethal force, operate with unpredictability, and succeed in a contested, degraded, and operationally limited environment. It will not be an easy concept to employ due to its stark operating differences from the current construct of centralized basing and decentralized operations. Still, the benefits will be well worth the discomfort of change. Adaptive basing enhances all seven operational functions: command and control, intelligence, information, fires, movement and maneuver, protection, and sustainment. To achieve those enhancements, plans for moving personnel and equipment into position and then sustaining those positions must be in place.

Logistics and sustainment prior to the fight are crucial to Adaptive Basing, which is not a reactionary concept to initiate after the first strikes occur. If China decides to strike the U.S. main operating bases in theater, the time to establish expeditionary bases will have passed. It may cause a deficit to steep to overcome without an extremely high cost in blood and treasure.

The recommendation for the CCDR is to direct changes in logistics and sustainment prior to operational employment of forces from Adaptive Bases. First, the commander must signal a capability requirement of forces to operate from Adaptive Bases. Second, instill a more modular logistics construct to right-size efforts with objectives. Third, the CCDR must update sustainment system tools and computers to ease logistical burdens and leverage AI capabilities. Fourth, Sea Basing should augment Adaptive Basing to use both land and sea options to the maximum ability. And lastly, the CCDR must seek innovative future sustainment methods to shrink the battlespace and keep up with technological advantages.

Annex

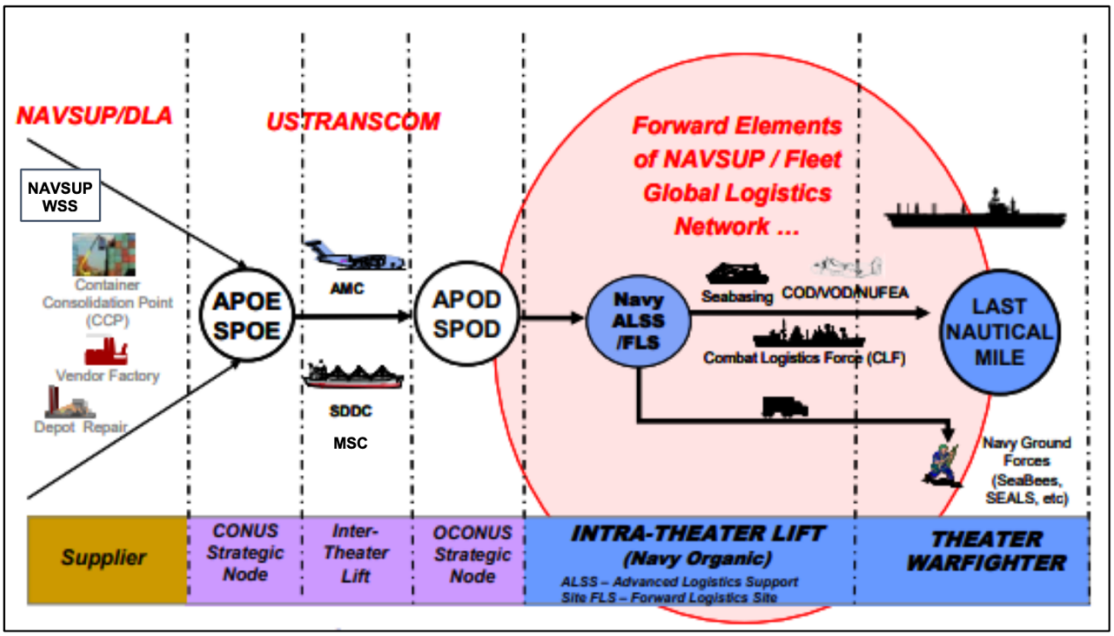


Figure 1 Logistics Support Model (Source: NAVSUP Pub 4, 2015)[27]

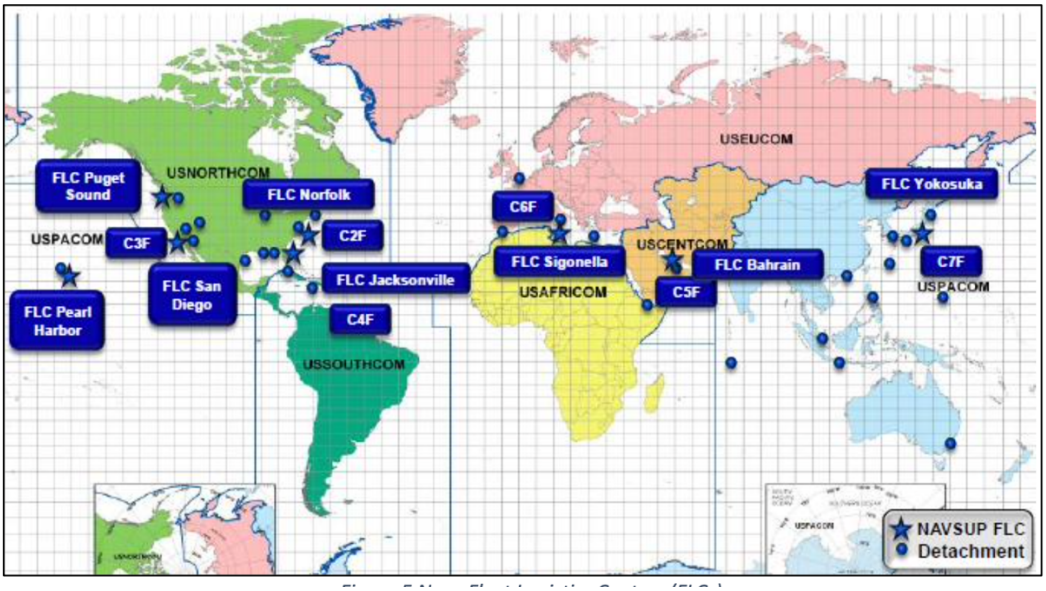


Figure 1 Navy Fleet Logistics Centers (FLCs)[28]

[27] James Gannon. "Naval Logistics Primer." (Newport, RI: Naval War College, Joint Military Operations Department, January 2019), 11.

[28] James Gannon. "Naval Logistics Primer." (Newport, RI: Naval War College, Joint Military Operations Department, January 2019), 11.

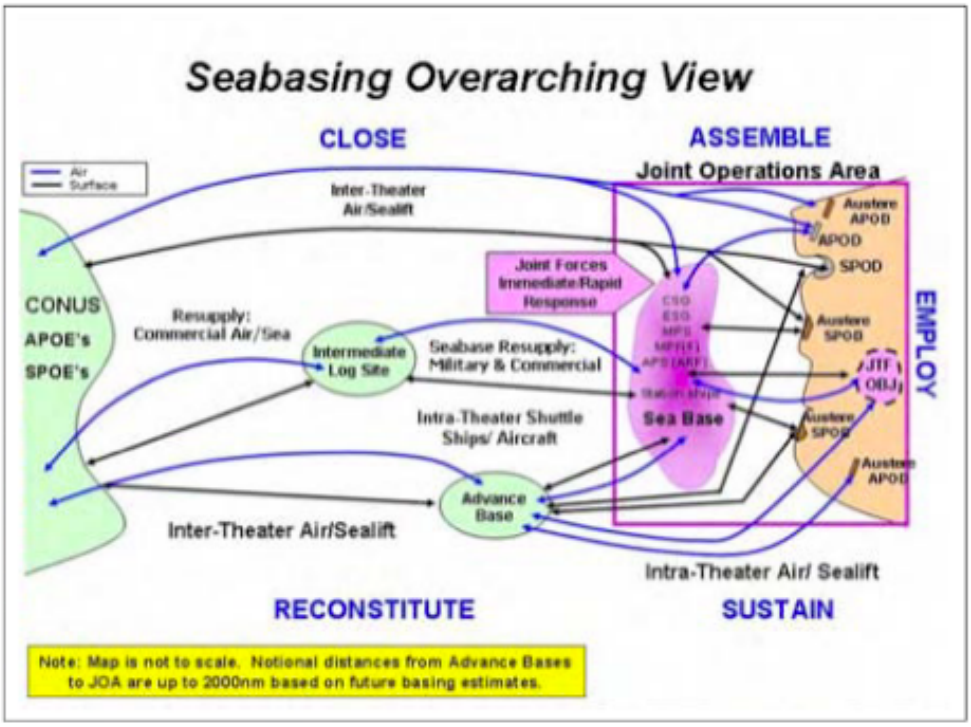
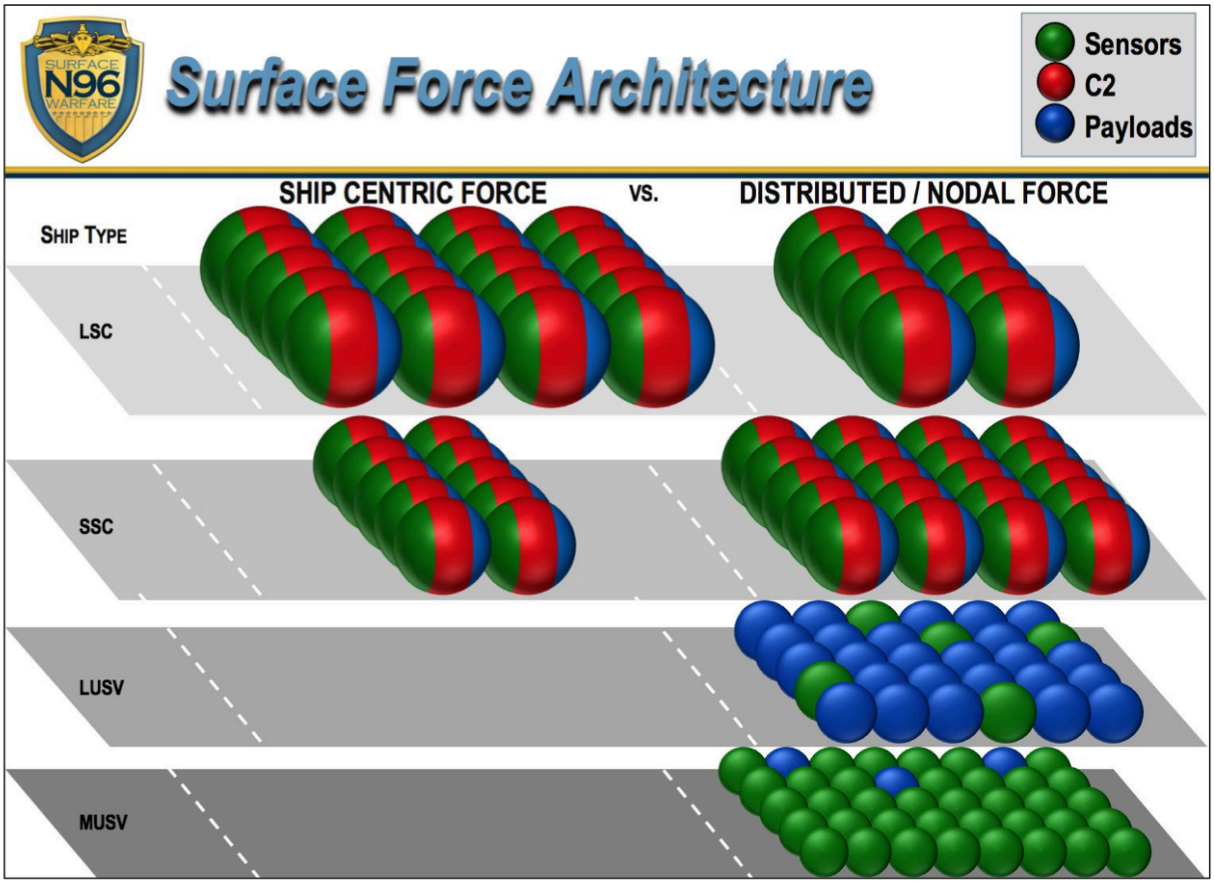


Figure 3- Graphical depiction of Joint Integration Concept: Sea Basing Illustration[29]

[29]Headquarters, Department of Defense, *Sea Basing Joint Integrating Concept* (Washington, D.C.: Department of Defense, August 2005), 21, cited in Jose Gonzalez, "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." Research paper, USMC Command and Staff College, Quantico, VA, 2013), 36. Accessed 22 April 2021. https://apps.dtic.mil/sti/pdfs/ADA601780.pdf

Each sphere represents a ship or unmanned surface vehicle (USV)



Source: Illustration accompanying Megan Eckstein, "Sea Hunter Unmanned Ship Continues Autonomy Testing as NAVSEA Moves Forward with Draft RFP," *USNI News*, April 29, 2019. The illustration was also included as Slide 2 in a Navy briefing entitled "Designing & Building the Surface Fleet: Unmanned and Small Combatants," by Rear Admiral Casey Moton at a June 20, 2019, conference of the American Society of Naval Engineers (ASNE).

Notes: Each sphere represents a ship or a USV. LSC means large surface combatant (i.e., cruiser or destroyer), and SSC means small surface combatant (i.e., frigate or Littoral Combat Ship). As shown in the color coding, the LSCs and SSCs are equipped with a combination of sensors (green), command and control (C2) equipment (red), and payloads other than sensors and C2 equipment, meaning principally weapons (blue). LUSVs and MUSVs, in contrast, are equipped primarily with weapons (blue) or sensors (green).

Figure 4 Navy Briefing Slide on Surface Combatant Force Architecture[30]

[30] U.S. Library of Congress, Congressional Research Service. *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress,* R32665 (Washington, D.C.: Congressional Research Service, September 2020), 14. https://crsreports.congress.gov/product/pdf/RL/RL32665/315

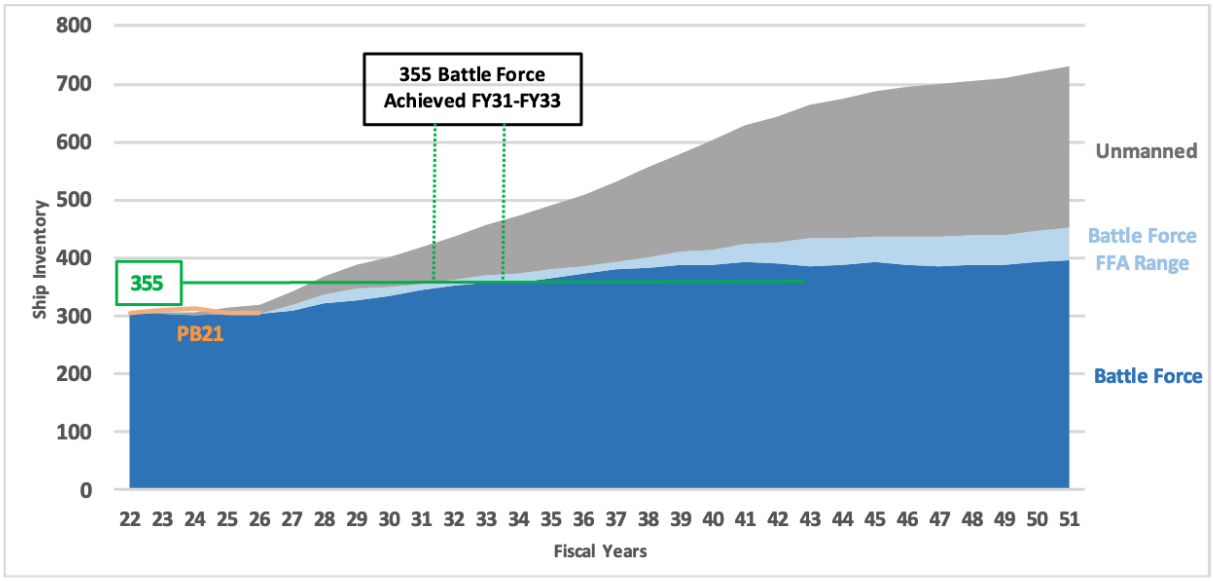
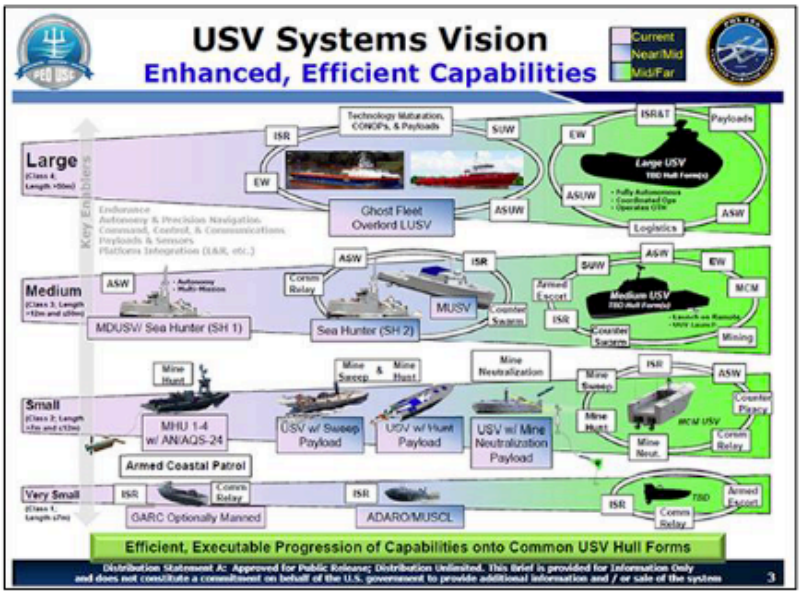


Figure 5 Naval Force Inventory Ranges (note the growth of Unmanned Vessels)[31]

[31] Chief of Naval Operations, U.S. Department of the Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels,* (Washington, D.C.: Department of the Navy, December 2020), 9. https://assets.documentcloud.org/documents/20422433/shipbuilding-plan-dec-20_navy_osd_omb_final.pdf



Source: Slide 3 of briefing by Captain Pete Small, Program Manager, Unmanned Maritime Systems (PMS 406), entitled "Unmanned Maritime Systems Update," January 15, 2019, accessed May 22, 2019, at https://www.navsea.navy.mil/Portals/103/Documents/Exhibits/SNA2019/UnmannedMaritimeSys-Small.pdf?ver=2019-01-15-165105-297.

Figure 6 Navy Unmanned Surface Vehicle Vision[32]

[32] U.S. Library of Congress, Congressional Research Service. *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress,* R45757 (Washington, D.C.: Congressional Research Service, March 2021), 3. https://fas.org/sgp/crs/weapons/R45757.pdf