

Charting the Pathway to OMFTS: A Historical Assessment of Amphibious Operations From 1941 to the Present

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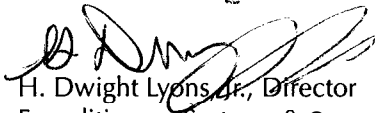
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Summary

The Director, Expeditionary Warfare Division (N75) asked us to assess the role of amphibious, maritime pre-positioning force, and tactical lift in the context of the U.S. Marine Corps' new concept for amphibious warfare, operational maneuver from the sea (OMFTS). The overall project is known as Relating Amphibious Lift to Forcible Entry. This report completes one task within the project, a historical assessment of amphibious operations, particularly as related to forcible entry and Marine Corps operational concepts. Specifically, we explain the rationale behind amphibious warfare, discuss the changes in amphibious warfare since 1941, and identify historical approaches to implementing operations that were similar to OMFTS. Thereby, we provide a general assessment of the relationship between OMFTS and historical reality.

The object of OMFTS is to increase the decisiveness of amphibious warfare. Historically, amphibious operations have been methodical and entailed substantial casualties to the attacker. OMFTS attempts to reverse this trend, partly through exploiting new technology, such as the MV-22 Osprey, the AAV, and command and control systems. "Seamless" maneuver will replace the former process of securing and holding a beachhead, stabilizing a lodgment, building up supplies, and finally advancing toward the operational objective. Assault forces will deploy directly from the amphibious fleet against the inland operational objective. The period between landing and significant advance from the beachhead, known as the operational pause, will be minimized through sea basing. Rather than building up supplies ashore, the landing force will be supplied directly from the amphibious fleet. Thereby, once the landing force has disembarked, it can advance rapidly rather than being tied to the lodgment while supplies are stockpiled. Optimally, OMFTS will comprise operations on a broad and deep front (extended front assaults). A naval expeditionary force, located over the horizon, will deploy self-contained formations of combined arms teams units along multiple axes of advance

against the operational objective. Instead of the traditional assault on a 1-mile front with no depth, amphibious forces will operate on an approximately 200-n.mi. front (230 miles) and a 100-n.mi. or more depth (115 miles). Obligated to defend such a vast area, the defender will supposedly be unable to concentrate forces against the assault point.

Our historical assessment has three components. First, we reviewed the historical literature on amphibious warfare in order to determine the reasons that amphibious warfare has been implemented and to learn about its development since 1941. By doing so, we were able to compare the historical utility of amphibious warfare to the expected utility of operational maneuver from the sea. Second, we examined quantitative parameters of amphibious warfare in order to explore general trends relevant to the success of OMFTS. Third, we examined nine case studies to gain greater insight into the substance and context of amphibious assaults, particularly those exemplifying the tenets of operational maneuver from the sea. Through the case study analysis, we derived historical approaches for the successful implementation of OMFTS.

Our major argument is that the stated premises underlying the OMFTS warfighting concept, while largely sound, are incomplete. On the positive side, OMFTS laudably attempts to move away from the traditionally high casualties and methodical operational tempo of amphibious warfare. Several of its premises for doing so are historically credible. Recent technological advances, from helicopters to information technology, have increased the potential for decisive amphibious operations since the Vietnam War. Furthermore, extending the assault front historically presented the opportunity for the penetration and exploitation of enemy weak points. Moreover, OMFTS gives logistics well-deserved emphasis. We found that the supply buildup ashore has indeed been a cause of operational pause, if not the sole determinant. In fact, sea basing has historical roots as a remedy for operational pause.

However, OMFTS as written neglects important historical constraints and demands on amphibious warfare. The concept is over-generalized as applicable to all forms of conflict near a littoral. Historically,

amphibious warfare has not been useful in all circumstances. During the Cold War, the possibility of a conflict escalating into a broadened or heightened war restrained the use of amphibious warfare. In addition, amphibious assaults have proven unable to cope with the dilemmas of unconventional warfare, especially in the guerrilla context of the Vietnam War.

Furthermore, OMFTS focuses on the positive effects of sea basing without realistically addressing how dispersed forces will survive in an intense combat environment. Operational pause was not solely a function of the supply buildup ashore. Enemy resistance was at least an equally important factor. Our quantitative data and case studies underline the relationship between enemy ground resistance and operational pause.

Likewise, extended front assaults cannot be implemented without a clear framework for overcoming enemy resistance. We found little evidence that self-contained formations will be able to penetrate enemy defenses on an extended front without fighting major engagements. Dispersal and lack of organic combat power have often made attacking formations vulnerable to more concentrated defending forces.

Thus, OMFTS needs to be refined into a more realistic and pragmatic concept. Strategic and operational constraints, such as the risk of escalation and unconventional warfare, need to be addressed. Moreover, means of overcoming enemy resistance in an intense combat environment require development. Otherwise, instead of moving “seamlessly” to the operational objective, self-contained formations may suffer from long operational pauses and potentially heavy casualties when inserted into a hostile and intense combat environment.

Introduction

The Director, Expeditionary Warfare Division (N75) asked the Center for Naval Analyses (CNA) to develop and assess the role of amphibious, maritime pre-positioning force, and tactical lift in the context of U.S. Marine Corps' new warfighting concept for expeditionary operations, known as OMFTS. This core project is entitled Relating Amphibious Lift to Forcible Entry. One task within the project is a historical assessment of amphibious operations, especially as related to forcible entry and Marine Corps operational concepts. This report fulfills that task. It explains the rationale behind amphibious warfare, discusses changes in amphibious warfare since 1941, and identifies historical approaches for success in operations similar to OMFTS. Thereby, we provide a general assessment of the relationship between OMFTS and historical reality.

OMFTS, together with its supporting concept of ship-to-objective maneuver (STOM), is described as a new and decisive form of amphibious warfare. In this new concept, assault units will penetrate deep into enemy territory along multiple axes over extended fronts (very broad or deep fronts). They will seize their operational objective directly and without pause. The major argument of our historical assessment is that the stated premises underlying the OMFTS warfighting concept are largely sound but incomplete. OMFTS includes notable means of transforming amphibious warfare, such as altering methods of supply, exploiting new technologies, and incorporating the principles of maneuver warfare. Indeed, there are historical indications that OMFTS might make amphibious warfare less methodical and less costly. Nevertheless, key historical constraints and demands of amphibious warfare have been neglected so far.

Our historical assessment shows that the OMFTS concept ignores the strategic and operational constraints that have historically been placed on the conduct of amphibious warfare. The concept paper claims that OMFTS will be useful in virtually all types of conflicts near

a littoral. But, historically, amphibious warfare has been useful in a circumscribed set of circumstances: specifically, in conventional wars in which the risk of escalation was low. It has been much less useful against unconventional methods of warfare or in conflicts involving a high risk of escalation.

Additionally, the OMFTS concept over-simplifies the requirements for successful implementation. The concept claims that operational tempo can be accelerated primarily through avoiding a large buildup of supplies ashore in the beachhead and instead transferring supplies directly from ships to units on the ground (sea basing). Our historical analysis shows that the buildup of supplies ashore has been but one drag on operational tempo. Enemy resistance has been at least equally important. Similarly, in proposing amphibious assaults over extended fronts, the concept papers marginalize historical evidence that dispersed landing forces have lacked the organic combat power to repulse enemy counteraction or easily overwhelm enemy strong points. Granted, OMFTS and STOM address some means of overcoming enemy resistance, such as using aggressive combined arms tactics and exploiting enemy weak spots. However, they fail to form a vision for how dispersed ground units will manage to maneuver rapidly and “seamlessly” in a high- or medium-intensity combat environment.

Methodology

The goal of this report is to provide a general assessment of the relationship between OMFTS and historical reality. We want to determine if claims put forth in the OMFTS and STOM concept papers have historical backing. In the process, the report seeks to explain the rationale for and provide a brief history of amphibious warfare.

In order to test the historical backing of OMFTS, we review amphibious warfare since 1941 and identify factors that contributed to the success of historical operations resembling OMFTS. Our findings are

then compared to the claims of the OMFTS and STOM concept papers.

Our methodology involves three processes for testing the relationship between OMFTS and historical reality: a general overview of the history of amphibious warfare since 1941, comparisons of quantitative data of amphibious assaults, and in-depth examination of nine case studies.

The general historical overview focuses on changes in amphibious warfare from the Second World War, through the Cold War (including Vietnam) and during the post-Cold War era. Besides providing a history of amphibious warfare, the aim is to determine whether the expected utility of OMFTS is realistic when we look at the historical utility of amphibious warfare. We focused on three questions:

1. How have strategic factors, such as the polarity of the international system, the totality of war, and the geostrategic location of states, affected amphibious warfare?
2. What changes have occurred in amphibious warfare on the operational level of war, specifically in terms of different offensive and defensive doctrines?
3. What have been the developments in the tactical context of amphibious warfare, focusing on ship-to-shore movement, threats to a surface fleet, and firepower support?

The comparisons of quantitative data examine the claims made in the OMFTS and STOM concept papers regarding two specific issues: minimizing operational pause and the beneficial effects of extended front assaults. Those issues are central to the concept of OMFTS. Analyzing them helps determine approaches for successfully implementing OMFTS. The quantifiable data were collected for over 34 amphibious operations. This sample enabled us to form generalizations on the trends within the history of amphibious warfare as a whole since 1941. We used the data to explore the benefits and limitations to minimizing operational pause and extending the breadth and depth of amphibious operations. We did this by seeing how the length of operational pause and the length of assault fronts interacted with other parameters of amphibious warfare, specifically the

force ratio, defensive operational doctrine, length of enemy ground resistance, and percentage of the total enemy force opposing the landing. Thereby, we were able to check whether claims made in the OMFTS and STOM concept papers could be confirmed historically.

The case studies are meant to provide greater insight into the substance and context of amphibious assaults than the sparse quantitative data. Again, we focus on examining whether claims made regarding the causes of operational pause and the expected effects of extended front assaults are backed by historical evidence. Furthermore, we use the case studies to identify approaches that led to success in historical operations resembling OMFTS. The case studies are divided into three sets. Four case studies address the causes of operational pause. Three case studies examine how operational pause has been successfully minimized. The remaining two case studies identify how extended front assaults have been successfully implemented. Information on case selection and specific methodology is presented directly before each set.

Regarding both the case studies and quantitative data, we focused on well-known amphibious assaults, usually involving more than 1,000 troops. All were forcible entry operations. In other words, the area of operations was not initially controlled by friendly forces. We did not examine peacekeeping operations, evacuations, or “administrative” landings. We also did not examine small-sized operations, such as raids, because of time and resource constraints.

In our research, we used mostly secondary sources, published primary sources, and a few unpublished primary sources.

Organization

The report is divided into five sections. This introduction is the first, which includes a summary of OMFTS and STOM.

The introduction is followed in the second section by a brief description of the rationale, on both the strategic and operational levels, for why states, especially the United States, maintain a robust amphibious warfare capability. Our intent is to present the reasons for why commanders and decision-makers implement amphibious warfare.

The third section comprises the general historical overview of the conduct of amphibious warfare from 1941 to the present. Again, this overview compares the expected utility of OMFTS to the historical utility of amphibious operations.

The fourth section attempts to ascertain the historical approaches for implementing operations similar to OMFTS. It does so through analyzing how operational pause has been minimized and how assaults on extended fronts have been successfully conducted. Both are examined through, first, a brief discussion of the quantitative data and, second, in-depth analysis of case studies. Briefly, the section is organized as follows:

1. We examine quantitative data and seven case studies in order to illustrate the causes of operational pause and how it was historically minimized. Specifically, we sought to determine if historical evidence suggested that sea basing is likely to be a sufficient means of minimizing operational pause.
2. We examine the quantitative data and two case studies in order to illustrate the effects of extended front assaults and how such assaults were historically successful.

The fifth section, the conclusion, summarizes our findings from the third and fourth sections. We compare the results of our historical assessments to the concept of OMFTS. We identify the claims of the concept that our historical assessment supports. Finally, historical constraints and demands likely to affect OMFTS that we found in the assessment are delineated.

The U.S. Marine Corps' new concept for forcible entry

OMFTS is the U.S. Marine Corps' latest concept for amphibious warfare. It attempts to apply maneuver warfare to amphibious

operations. Maneuver warfare seeks to defeat enemy forces decisively though placing them in a disadvantageous position on the battlefield. Rather than frontal assaults or cautious advances, daring and mobile operations seize the initiative and strike the enemy where least expected. Thereby, amphibious warfare will supposedly become more decisive. The U.S. Marine Corps' concept paper for OMFTS states: "The heart of OMFTS is the maneuver of naval forces at the operational level, a bold bid for victory that aims at exploiting a significant enemy weakness in order to deal a decisive blow."¹

The concept paper asserts that decisive amphibious operations are needed to counter "chaos in the littorals." Supposedly, three different threats challenge the United States along the world's littorals. First, a widespread breakdown in order within countries has encouraged outbreaks of violence by non-state actors on a global scale. Second, certain regional powers, especially those that might acquire nuclear weapons, threaten the United States. Third, although the United States is currently the only superpower, a rival will eventually arise and the U.S. armed forces must be prepared to overcome the challenge.² The concept paper implies that amphibious warfare will be useful in countering all of these threats.

Historically, amphibious operations have been methodical in operational tempo and entailed substantial casualties to the attacker. During World War II, amphibious assaults usually experienced a long operational pause as forces secured a lodgment before breaking out and destroying the enemy. We define operational pause as the period between landing and advancing from the beachhead or landing zone toward the operational objective. The average operational pause for the 22 major amphibious assaults of the war was 18 days.³

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1. "Operational Maneuver From the Sea," *Warfighting Concepts for the 21st Century* (Quantico: Concepts Division, Marine Corps Combat Development Command, 1998), I-9.
 2. *Ibid.*, I-5–I-9.
 3. Calculated from table 2, in section 4.

Additionally, casualty rates in landing forces were generally high. Figure 1 shows the casualty rates suffered by the attacker in World War II amphibious campaigns. As a point of comparison, table 1 shows the casualty rates for the entire set of amphibious campaigns we studied for this report. For example, the U.S. Marines suffered approximately 30 percent casualties in the battles for Iwo Jima and Peleliu, roughly the same as Russian losses in the Battle of Stalingrad and much greater than U.S. losses in the bloody battle for Manila in 1945.

Figure 1. Casualty rates of amphibious assaults, 1941-1945

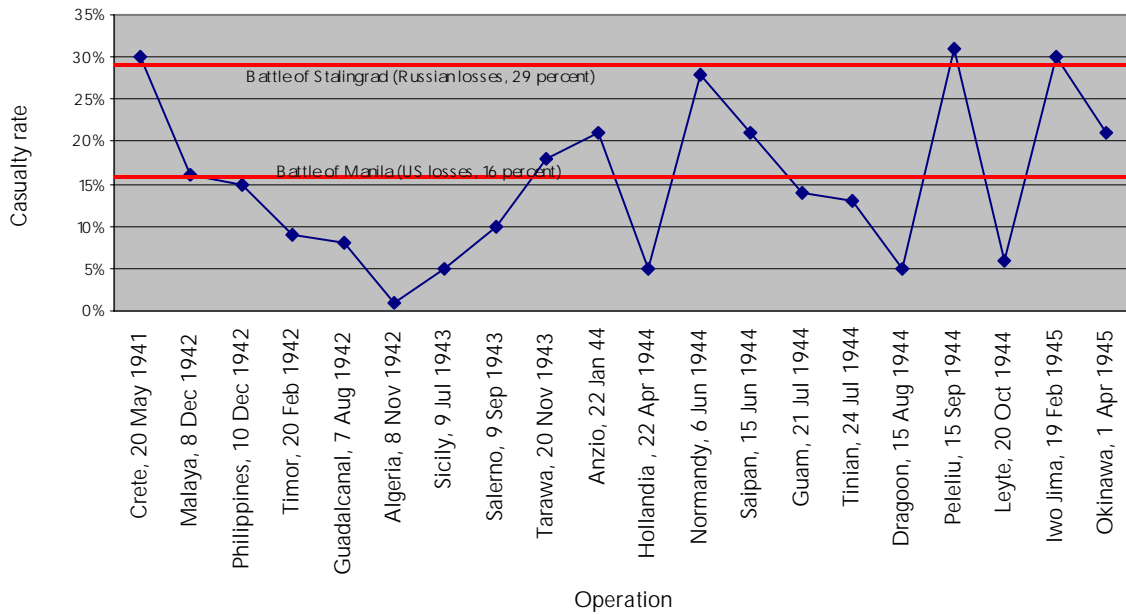


Table 1. Casualty rates of landing forces for amphibious campaigns

Operation	Casualties	Landing force	Casualty rate (percentage)
Crete	6,700	22,000	30%
Malaya	9,800	60,000	16%
Philippines	12,000	79,000	15%
Timor	500	5,900	8%
Guadalcanal	6,200	81,000	8%
Algeria	1,500	107,000	1%
Sicily	22,800	478,000	5%
Salerno	12,000	115,000	10%
Tarawa	3,300	18,000	18%
Anzio	23,200	110,000	21%
Hollandia	4,000	80,000	5%
Normandy	208,800	750,000	28%
Saipan	16,500	78,000	21%
Guam	7,800	54,900	14%
Tinian	2,200	17,400	13%
Dragoon	13,600	250,000	5%
Peleliu	8,700	28,500	31%
Leyte	15,600	257,800	6%
Iwo Jima	26,000	87,000	30%
Okinawa	59,400	290,000	21%
Inchon	2,400	53,900	4%
Suez	200	22,000	1%
Starlite	200	5,000	4%
Deckhouse IV	200	1,100	18%
Beau Charger	1,000	5,500	18%
Belt Tight	1,000	5,500	18%
Badger Tooth	100	1,800	6%
Falklands	1,000	9,500	11%
Grenada	100	8,500	1%

The OMFTS concept paper claims that “significant enhancements in information management, battlefield mobility, and the lethality of conventional weapons” present an opportunity to increase the decisiveness of amphibious operations.⁴ Advances in precision long-range weaponry, sea-based fire support, and possibly vehicle fuel requirements will reduce the need for stockpiling supplies ashore. New command and control systems facilitate rapid decision-making. Thus, operational tempo will accelerate. The Marine concept paper on STOM specifies that the Advanced Amphibious Assault Vehicle (AAAV), MV-22 aircraft, and the global positioning system are some of the technologies that will improve decisiveness.

The new forcible entry concept behind OMFTS is STOM. STOM envisages amphibious forces assaulting directly from the amphibious fleet toward the operational objective. Forces will move “seamlessly” through the beachhead rather than securing a lodgment for the ponderous stockpiling of supplies prior to the breakout. During the entire assault, the amphibious fleet will remain over the horizon, where it will be less vulnerable to current anti-ship missile and mine threats.⁵

OMFTS and STOM are framed around six characteristics. First, operations are oriented toward attaining the operational objective quickly and directly. Operational objective is ambiguously defined as “something that is essential to the enemy’s capability to continue the struggle.”⁶ Second, naval forces use the sea as maneuver space—in other words, to attack an opponent from an unexpected direction. Third, tactical actions generate overwhelming tempo and momentum. Fourth, assaults pit the attacker’s strength against the defender’s weakness. Fifth, emphasis is placed on intelligence, deception, and

4. “Operational Maneuver From the Sea,” *Warfighting Concepts for the 21st Century* (Quantico: Concepts Division, Marine Corps Combat Development Command, 1998), I-3.

5. “A Concept for Ship-to-Objective Maneuver,” *Warfighting Concepts for the 21st Century* (Quantico: Concepts Division, Marine Corps Combat Development Command, 1998), II-1--II-4.

6. “Operational Maneuver From the Sea,” *Warfighting Concepts for the 21st Century* (Quantico: Concepts Division, Marine Corps Combat Development Command, 1998), I-9.

flexibility. Sixth, the assault force integrates all organic, joint, and combined assets.⁷

Optimally, OMFTS should enable broad and deep front operations. We have termed such operations “extended front assaults.” The concept paper illustrates that a naval expeditionary force, located over the horizon, would deploy multiple strike forces against the operational objective. Instead of the traditional assault on a 1-mile front with no depth, amphibious forces would operate on a front about 200 n.mi. (230 miles) long and 100 n.mi. (115 miles) deep. The landing force would be supplied directly from the sea base (amphibious and maritime prepositioning ships) rather than through a supply dump, with a large footprint, ashore. Because the amphibious fleet would be located beyond the horizon, the defender would be unsure of the likely point of attack. Obligated to defend a vast area, the defender supposedly would be unable to concentrate forces against the amphibious assault.⁸

7. Ibid., I-11.

8. “A Concept for Ship-to-Objective Maneuver,” II-7.

What is the purpose of amphibious warfare?

This section of the historical assessment provides a brief explanation of why states employ amphibious warfare. A form of forcible entry operations, amphibious operations are the method of deploying ground forces onto hostile territory via the sea. Commanders and decision-makers implement amphibious warfare on either the strategic or operational level of war.

Amphibious warfare and the strategic level of war

Amphibious warfare is implemented on the strategic level if its use is fundamental to attaining a state's political aims. Primarily, amphibious warfare is a vehicle for engaging enemy ground forces when the sea is the only convenient means of access. Sir Julian Corbett (1854–1922), a father of naval strategy, argued that the most important role of sea power was enabling ground forces to engage and coerce the enemy. Historically, amphibious operations have been the mode of delivering ground forces to a theatre of war. When a theatre has been non-contiguous to friendly territory yet possessed a littoral, amphibious operations have been essential to the war effort.

Amphibious operations serve two types of strategy: a total strategy of annihilating the enemy's ability to defend itself, and a limited strategy that engages a segment of the enemy's armed forces or seizes a piece of territory. Corbett referred to these two types of strategy when he wrote:

The combined [amphibious] operations which were the normal expression of the British method of making war...were of two main classes. Firstly, there were those designed purely for the conquest of the objects for which we went to war...and secondly, operations...designed not for permanent conquest, but as a method of disturbing our enemy's plans and strengthening the hands of our allies and our own position.⁹

In the context of a total strategy, amphibious landings are a prelude to decisive operations against the enemy's armed forces. Once ashore, ground forces compel the enemy's submission through annihilating his armed forces and threatening his population with destruction. Thus, amphibious warfare is particularly relevant to maritime powers such as the United States, the United Kingdom, and Japan. Separated by large bodies of water from their adversaries, these countries can deploy substantial ground forces against an opponent only if they possess territory or an ally contiguous to the war zone, or if they can conduct amphibious warfare.

The Normandy invasion epitomizes the use of amphibious warfare to support a total strategy and engage and annihilate an adversary. In 1940, Nazi Germany occupied France and drove the British from the European continent. Germany effectively gained control of continental Europe's littoral. Despite being entirely on the defensive, Prime Minister Winston Churchill recognized the strategic imperative of returning to the continent if Germany was ever to be completely defeated. He created a Combined Operations Staff to develop amphibious doctrine and equipment for an invasion of the continent. This was, of course, a long-term objective. In 1940, Britain was far too weak to confront the Germans directly. Upon entry into the war, the United States concurred with British thinking. A cross-channel invasion became the driving force of Western Allied grand strategy. Without such an invasion, the Western Allies would have been sidelined to peripheral operations against Germany while the Soviet Union bore the brunt of the war. U.S. Army strategic planners wrote: "We must prepare to fight Germany by actually coming to grips with and definitely breaking her will to combat."¹⁰

In a limited strategy, the strategic purpose of amphibious warfare is not related to annihilating the enemy's main forces. Rather, amphibious warfare serves to engage a segment of enemy forces or seize

9. Julian Corbett, *Some Principles of Maritime Strategy* (Newport: Naval Institute Press, 1972) 57--58.

10. Maurice Matloff, "Allied Strategy in Europe, 1939--1945," *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*, Ed. Peter Paret (Princeton: Princeton University Press, 1986), 685.

territory. As Corbett noted, all wars do not require the absolute annihilation of an enemy state and the all-out application of land power.¹¹ For example, amphibious operations in a peripheral theatre often have not concerned the annihilation of the enemy but simply the engagement of a segment of its armed forces. Many conflicts and campaigns have been fought purely over a piece of territory, such as the 1982 Falklands War or the 1941 Malayan Campaign. Amphibious assaults were the only means of engaging enemy forces in these examples.

Amphibious warfare and the operational level of war

Amphibious warfare is implemented on the operational level if it is a means for prosecuting particular campaigns or battles rather than the war as a whole. Amphibious assaults serve operational strategy through two types of actions.

First, amphibious assaults frequently are a means of outmaneuvering an opponent and gaining an operational advantage. The sea provides scope to strike the opponent at an unexpected location. In particular, amphibious operations can outflank enemy forces by landing formations behind their lines. Some of the best-known amphibious assaults, such as Hollandia and Inchon, were implemented with this purpose in mind.

The Hollandia landing (April 1944) outflanked and encircled Japanese forces on New Guinea. Operations in New Guinea were part of MacArthur's larger advance toward the Philippines. In 1943, General Douglas MacArthur's Australian and American forces pushed the Japanese westward to Wewak, on New Guinea's northern coast. However, MacArthur did not want to slog through the fortified Japanese positions there. Therefore, he decided to bypass it and strike the main Japanese base further west at Hollandia, which was relatively unprotected. He launched a two-division amphibious assault against Hollandia and other important points to the Japanese rear.

11. Azar Gat, *A History of Military Thought: From the Enlightenment to the Cold War* (Oxford: Oxford University Press, 2001), 484.

Consequently, the major concentration of Japanese force, at Wewak, was cut off and left isolated in the inhospitable jungle while MacArthur's strategic advance continued toward the Philippines.

At Inchon in September 1950, MacArthur, commanding the U.S.-led forces, mounted another amphibious assault that outmaneuvered the opposing forces. Dubbed Operation Chromite, it was explicitly planned as an operational maneuver to cut off North Korean forces in South Korea and thereby facilitate their annihilation. The 1st U.S. Marine Division would land at Inchon, the port for Seoul. MacArthur believed the North Koreans would never expect such a bold move and would not have strong forces at Inchon. Once ashore, the Marines would drive through Inchon to Seoul, the most important communications hub in Korea, cutting off the North Koreans to the south. Indicatively, during the critical planning conference for the landing, MacArthur said: "We shall land at Inchon, and I shall crush them."¹² Indeed, the assault caught the North Koreans off guard and routed their forces in South Korea.

Second, amphibious assaults often serve an operational purpose by seizing significant pieces of territory, particularly islands. These pieces of territory are not strategic objectives, such as the Falklands or Singapore, but ones that facilitate operations within a campaign or theatre. For example, the Germans assaulted Crete in 1941 because of its geostrategic position. From Crete, the British could have mounted air attacks on Romania's oilfields. Such attacks would have threatened Germany's southern flank and hindered the invasion of Russia. More generally, during the Pacific War, the Central Pacific Campaign revolved around capturing key island airfields and bases to support the advance on the Philippines and Japan, while bypassing less important points.

12. Edwin Simmons, *Over the Seawall: U.S. Marines at Inchon* (Washington, DC: Marine Corps Historical Center, 2000), 15.

Historical changes in amphibious warfare

This section of the historical assessment examines the dynamics behind amphibious warfare from 1941 to the present. The purpose is to determine whether the expected utility of OMFTS is supported by historical reality. In our research, we found that history supports some of the basic attributes of OMFTS. However, there are several constraints upon OMFTS that the concept papers do not address.

Amphibious warfare in World War II

During World War II, hundreds of amphibious assaults were conducted and the modern concept of amphibious warfare came into being. The equipment, operational doctrines, and tactics that define amphibious warfare were developed over the course of the war.

The strategic environment

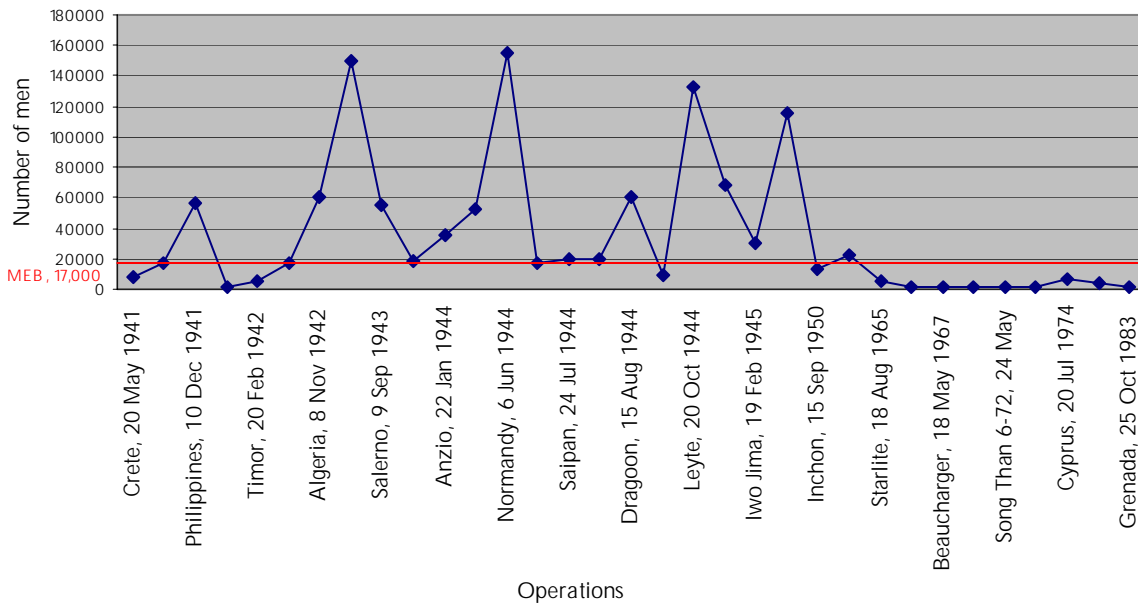
World War II was a total war. The war aims of the combatants called for the unconditional surrender of their opponents. To effect total war aims, the combatants sought to annihilate their opponents' armed forces. If rendered defenseless, the enemy would have no choice but unconditional surrender. Total aims demanded total means. States mobilized and exploited their economies absolutely toward the war effort. Economic power was harnessed to produce mass numbers of tanks, aircraft, vessels, and other implements of war. Governments placed few constraints on military spending.¹³

Total war shaped the nature of amphibious warfare. Amphibious assaults were a vehicle for pursuing the annihilation of the adversary's armed forces. Major amphibious invasions of the Philippines, Italy,

13. Michael Howard, *War in European History* (Oxford: Oxford University Press, 1976), 134.

and France led to the destruction or unconditional surrender of the opposing forces. Amphibious assaults were conducted with as much force as possible. They entailed hundreds of vessels, tanks, and aircraft. Figure 2 shows the numbers of troops deployed in World War II amphibious assaults compared to the numbers deployed in the Cold War and the approximate numbers in a Marine Expeditionary Brigade (MEB) today.¹⁴ In World War II, lavish firepower often decimated enemy defenses. In particular, the industrial might of the United States furnished mass numbers of amphibious craft, close support aircraft, and naval gunfire support vessels.

Figure 2. Size of the assault force on D-day, in World War II, and in the Cold War



14. Current amphibious assault capabilities are measured in MEBs.

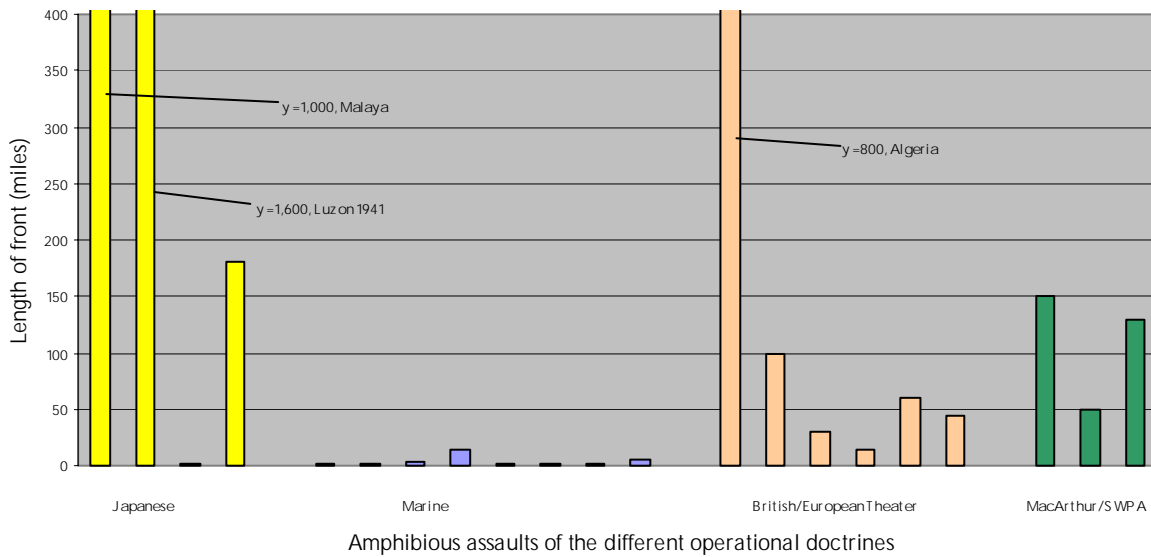
In addition to the totality of warfare, the geostrategic location of the major combatants affected the usefulness of amphibious warfare in World War II. Japan, the United States, and the United Kingdom were maritime powers. They could not engage their adversaries on the ground or occupy territory without transporting forces overseas and onto a hostile shore. Accordingly, amphibious warfare became central to their respective grand strategies.

Operational doctrine development and refinement

Amphibious warfare attained a high level of operational development during World War II. Four amphibious operational doctrines were devised: by the Japanese, the British, the U.S. Marine Corps, and General MacArthur.

The Japanese developed an amphibious warfare doctrine in the early twentieth century and started intensive training in the 1920s. They were well prepared to conduct extensive amphibious assaults by 1941 and 1942. The Japanese doctrine was based on aggressive operations that outmaneuvered the enemy. Planning was intensive and meticulous. The Japanese often conducted complex, carefully planned, and simultaneous multiple landings over extended fronts (see figure 3). Air and sea superiority was not a prerequisite for an amphibious landing. Indeed, in Malaya and the Philippines, battles for air and sea superiority occurred during the actual landings. To maximize surprise, the Japanese targeted likely enemy weak spots and specialized in night operations. Once ashore, Japanese infantry marched hard and fast to create mobility. When necessary, the Japanese established beachheads or captured airfields to facilitate logistical support. For example, in Malaya, the Japanese formed a lodgment at Kota Bharu, deep behind British lines, for the delivery of supplies and reinforcements. However, when possible, (for instance in the other landings of the Malayan Campaign), the infantry did not consolidate the lodgment but pressed forward with no operational pause.

Figure 3. Length of front for World War II amphibious assaults, sorted by doctrine



British amphibious doctrine—with major U.S. contributions—was a fundamental component of Allied grand strategy in Europe. As noted above, Allied grand strategy in the war against Germany revolved around mounting a cross-channel invasion of France. British amphibious doctrine was predicated upon establishing a concentrated body of force on the beach with minimal casualties. The British sought to exploit German weak spots and targeted poorly defended beaches. They focused on landing all forces at mutually supporting beachheads that could be consolidated into a single lodgment. This was most conspicuous in General Bernard Montgomery’s planning for Sicily and Normandy. The doctrine emphasized surprise. The British preferred to land at night, following a short and furious bombardment. A long bombardment would have allowed the Germans to transfer reserves to the threatened front. The British and Americans in Europe also incorporated airborne assaults into amphibious operations. Airborne formations dropped behind enemy lines to hold key positions until the seaborne forces arrived. Combined arms tactics marked British assaults. Special tanks were even

developed to provide shock power. Following the initial assault, British commanders preferred to concentrate their forces defensively around the lodgment, particularly because of the German propensity to launch furious counterattacks. To facilitate supply, the British tried to capture a port shortly after the initial assault. Major ports were generally avoided in the actual amphibious assault, though, because of the likelihood of heavy casualties, as experienced in the 1942 Dieppe Raid.

During World War II, the U.S. Marine Corps specialized in amphibious warfare. The Marines operated alongside the U.S. Navy in a series of assaults against small islands in the Pacific Ocean, often thousands of miles from any continent. The Marines had developed an amphibious doctrine prior to World War II, published in the *Tentative Manual for Landing Operations*. Amphibious warfare as practiced by the U.S. Marines was an overwhelming combined arms frontal assault. The Marines needed to overcome concentrated and fortified Japanese defenses, especially on small islands and atolls. This required firepower, shock power, and aggressive infantry tactics. Following the bloody battle on Tarawa, the U.S. Navy conducted methodical and extended bombardments of enemy positions, meant to saturate all targets, one by one. Such bombardments made it impossible to surprise the defenders. Additionally, tanks and specialized amphibious vehicles were readily employed. Once ashore, Marines pressed quickly inland. Given the small size of Pacific islands and atolls, they generally did not need to secure a lodgment (see figure 3). Rather, the objective was to exploit any enemy vulnerability and annihilate his forces as quickly as possible. To support the U.S. Navy and Marine Corps offensive across the Pacific, planners developed an involved logistics system. A floating supply train was created, replete with oil tankers, ammunition ships, repair ships, tugs, hospital ships, and supply vessels.

The South West Pacific Area (SWPA), under General Douglas MacArthur, adopted a different amphibious doctrine from that of the U.S. Marine Corps. MacArthur's forces operated primarily in New Guinea and the Philippines. SWPA received fewer resources than the Central Pacific command (CENTPAC). For example, SWPA's naval component, the U.S. Seventh Fleet, had no fleet aircraft carriers or

battleships. Such naval support existed only when it was loaned from CENTPAC. The scarcity of resources affected amphibious operations. The lack of overwhelming naval gunfire often precluded concentrated landings against strongly defended points. Therefore, MacArthur tended to strike enemy weak points. Once ashore, units would proceed to capture a port or airfield, in order to increase the flow of supplies. MacArthur's assaults often involved multiple landings over a broad front (figure 3). Due to the large landmasses of the Philippines and New Guinea, the Japanese were less concentrated and, thus, less able to deal with multiple landings.¹⁵

Defensive operational concepts

During World War II, defenders also developed operational concepts to counter amphibious warfare. They can be generally grouped into three categories: forward defense, mobile defense, and in-depth defense.

Forward defense entailed meeting the assault force at the water's edge. Defenders sought to prevent the amphibious forces from establishing a beachhead. Forward defense was based on the premise that the attacker would be most vulnerable when disembarking from landing craft. Therefore, the attacker should be fought and destroyed at the beachhead. For example, a Japanese commander preparing the Tarawa defenses instructed his forces:

When the enemy is assembling for a landing, wait until the enemy is within effective range, direct your fire on the enemy transport group and destroy it. If the enemy starts a landing, knock out the landing boats with mountain gun fire, tank guns and infantry guns, then concentrate all fires on the enemy's landing point and destroy him at the water's edge.¹⁶

15. Terry Pierce, "Disguising Innovation," Doctoral Dissertation, John F. Kennedy School of Government, Harvard University, March 2001, 145. Dean Allard, "The U.S. Navy Comes Ashore in the Mediterranean," *Naval History* (September/October 1997), 47.

16. Theodore Gatchel, *At the Water's Edge: Defending against Modern Amphibious Assault* (Annapolis: Naval Institute Press, 1996), 123.

To bolster defensive strength, entrenchments and fortifications were often built along the coast. A forward defense frequently resulted in heavy fighting at the beachhead, as assault units grappled with the defensive system. However, attacking with heavy firepower support or against an enemy weak spot could break the defensive system quickly if it lacked depth. Examples of forward defense are the battles for Algeria, Tarawa, Normandy, Tinian, and Guam.

Mobile defense was based on counterattacking an amphibious landing with carefully massed reserves. The defender concentrated forces for a decisive counterblow instead of dispersing them along the entire coastline. Mobile defense was used partly as an improvement on forward defense. The Germans and Japanese used it in the battles for Sicily, Salerno, Anzio, the south of France, and Saipan. Mobile defense often forced the defender to engage in a prolonged battle for the beachhead.

Mobile and forward defense were both vulnerable to the amphibious force's long-range firepower. Naval gunfire and air power could significantly damage forces that were either in static positions or advancing in the open toward the battlefield. Accordingly, after the Battle for Saipan, the Japanese began developing an operational strategy that avoided American firepower—in-depth defense. In-depth defense abandoned the beaches. Fortifications were constructed inland on strong defensive terrain, outside the range of naval gunfire and obscured from enemy aircraft. The idea was that the major battle would be fought around the prepared fortifications, with the intention of inflicting casualties on the Americans. Even then, the Japanese would not stand and fight to the death, but delay and then withdraw once the odds became too great. In the process, American strength would be worn down, hopefully delaying the strategic advance toward Japan. The Japanese employed in-depth defense at the battles for Iwo Jima, Okinawa, Leyte, and Luzon.¹⁷

17. Gatchel, 44, 137–138, 143.

World War II assault and area denial tactics

This sub-section examines the tactics used to execute and defeat amphibious landings in World War II. We briefly discuss ship-to-shore movement, the threats to surface vessels, and the role of air and naval firepower support.

Ship-to-shore movement

World War II witnessed the full development of tactics and equipment for amphibious assaults. Throughout World War II, the Western Allies deployed tremendous amphibious flotillas. They landed entire divisions, and often corps, in a single day. At Saipan, 700 amtracs (tracked landing vehicles) unloaded 8,000 Marines on a 4,000-yard front in 20 minutes. Twenty thousand men were ashore by the end of the day.

Before World War II, no landing craft other than small boats had existed. During the war, the United States and Great Britain designed a plethora of craft for landing infantry, tanks, and supplies on the beach. Specialized armor provided firepower and shock for the initial landing. The United States and Britain also constructed landing ships with well decks for deploying landing craft (LSTs, LSIs, and LSDs) for an assault. With its great industrial might, the United States produced huge numbers of landing craft and ships.

Airborne forces participated in the initial amphibious assaults on Crete, Sicily, and Normandy. The Allies used airborne formations to cut off enemy forces or hold a critical position until seaborne forces advanced from the beach. At Crete, the German main assault was actually the airborne drop. Airborne landings were prone to inaccuracy and confusion. Once dropped, formations were often dispersed and disorganized. Reorganization for offensive action could require several hours, if not days. During that time, the formations were vulnerable and virtually immobile. Seaborne forces remained the key component of amphibious operations.

Threats

In World War II, air, surface, and sub-surface attacks frequently struck fleets supporting an amphibious assault. Air attacks were the primary threat to surface vessels, accounting for 30 percent of all vessels sunk in the war as a whole.¹⁸ Fleets at Crete, Guadalcanal, Salerno, and Okinawa suffered substantial losses to air strikes. At Guadalcanal, Admiral Frank Fletcher infamously withdrew his aircraft carriers and surface vessels from the amphibious operating area the day after the landing because he believed the air threat was so grave. Although the fleet eventually returned, Japanese air attacks sank vessels throughout the 6-month battle, including the aircraft carrier *Hornet*, and inhibited the supply of the Marines ashore. Thereafter, air superiority became a prerequisite for amphibious assaults. Nevertheless, battles for air supremacy accompanied the assaults on Sicily, Salerno, Saipan, Leyte, and Okinawa. At Okinawa, the notorious Japanese kamikazes as well as conventional bombers sank 34 Allied ships and damaged another 368.

Not only aircraft, but also destroyers, cruisers, and battleships could threaten a fleet conducting amphibious operations. The Japanese surface fleet attacked the U.S. fleet at Guadalcanal, Leyte, and Okinawa. Two days after the initial landing at Guadalcanal, Japanese cruisers and destroyers annihilated the U.S.-Australian screening unit at the Battle of Savo Island. The amphibious fleet, which was unloading supplies, was unprotected. Fortunately, the Japanese did not press the attack. In general, the threat from destroyers, cruisers, and battleships was minimal as long as the amphibious force held complete air superiority.

Lastly, sub-surface threats—mines and submarines—inhibited many landings. For example, a Japanese submarine struck two aircraft carriers and one battleship, in a single attack off Guadalcanal. The mine threat was overcome throughout the war but always presented a problem. Even at Normandy, where the Allies had undisputed air and naval supremacy, German mines sunk or damaged 43 vessels.¹⁹ On

18. John Ellis, *World War II: A Statistical Survey* (New York: Facts on File, 1993), 262.

19. Gatchel, 74.

the other hand, Allied numerical superiority was usually so great that the submarine threat could be controlled. For example, German submarines sank only seven Allied vessels off Normandy.

Firepower support

World War II amphibious assaults depended upon a high volume of naval gunfire and air support. Air and naval gunfire bombardments were often overwhelming before and during an assault to compensate for the assault force's lack of organic artillery. Most assaults received the support of over 100 aircraft. Over 1,000 aircraft supported the assaults in Normandy, southern France, and Okinawa.

World War II was the highpoint of naval gunfire support. Cruisers, and battleships equipped with 16-inch guns, backstopped amphibious assaults. In the Pacific, older battleships formed a bombardment group for virtually every major amphibious assault. The group bombarded Guam for 13 days prior to the actual assault. At Peleliu, four battleships and four cruisers shelled the island for 3 days before the assault and then supported the ground forces for 14 days during the battle itself.²⁰ The Japanese commander at Saipan reported that naval gunfire was the decisive advantage possessed by the United States. In Europe, naval gunfire also played an important role. Throughout the first month of the Normandy campaign, German ground commanders feared fighting within range of the seven Allied battleships. And at Salerno, naval gunfire single-handedly halted the German armored counterattack against the beachhead.²¹

Amphibious warfare during the Cold War

The nature of amphibious warfare underwent a fundamental change during the Cold War. Strategically and operationally, there were fewer circumstances in which amphibious warfare was useful. Tactically, new technology provided for new means of ship-to-shore

20. CNA Operations Research Group. (CNA) 91 030017.00, *Naval Gunfire and Air Support of Landing Operations on Peleliu*, 20 Apr 1945.

21. Gatchel, 47.

movement, new threats to surface vessels, and greater effectiveness of air power. In general, the scope for amphibious operations in warfare decreased while the potential for decisive action increased.

Changes to the strategic context

The strategic context of warfare changed dramatically following World War II. First, two superpowers, instead of several, now dominated the international system. The United States and Soviet Union vied with each other for power and influence on a global level. A gain by one was viewed as a loss by the other, even if it occurred in a seemingly innocuous area of the world, such as Vietnam or Afghanistan. Therefore, any conflict could escalate into a wider superpower conflagration.

Second, by 1949, both superpowers had atomic weapons. Atomic (and later nuclear) weapons revolutionized warfare. The power of an atomic warhead multiplied the destructiveness of strategic bombing exponentially. A total war would involve unprecedented levels of destruction and would be unbearably costly. Furthermore, the primary means of delivery, missiles, were nearly impossible to intercept, precluding any effective defense against a nuclear strike.²²

Third, the protracted nature of the Cold War demanded limits on defense expenditures. Countries could not permanently sustain World War II levels of spending. Equally, in the first decade of the Cold War, many countries, including the Soviet Union and United Kingdom, were still recovering from World War II and could not afford to engage in a third world war.

Together, these three factors meant that the great powers—the same countries most capable of amphibious warfare—avoided actions that might have caused a conflict to escalate into a total war. Even in peripheral conflicts, the great powers sought to mitigate the risk of escalation. Military offensives that might have decisive results, whether on the ground, in the air, or at sea, were frequently viewed

22. Bernard Brodie, *Strategy in the Missile Age* (Princeton: Princeton University Press, 1959), 150-158.

as too risky. Accordingly, the implementation of large and decisive amphibious assaults became constrained. Political scientist John Pay conveyed the effect of nuclear weapons on amphibious assaults when he wrote: “Launching a major, strategically crucial, amphibious assault like the D-Day landings of 1944 would be particularly foolish against a nuclear-armed enemy who had concluded that the stakes were such that the landing should be opposed by nuclear means.”²³

The history of the Cold War provides several examples of how the risk of escalation constrained amphibious warfare. General Omar Bradley, Chairman of the Joint Chiefs of Staff, said in March 1949 that the A-bomb precluded major amphibious landings. Various commentators have since disdained his comment because the Inchon landing occurred just 18 months later. The Inchon landing facilitated the annihilation of the North Korean armed forces and enabled the United Nations Command to invade North Korea. However, rather than prove the continued usefulness of amphibious warfare, Inchon actually demonstrated its limitations. Recent historical research shows that the Inchon landing directly contributed to the Chinese decision to intervene in the Korean War.²⁴ Mao and the Chinese leadership found the potential annihilation of the North Korean Army very threatening. The Soviet Union, also fearing North Korea’s defeat, supported the Chinese intervention. Consequently, Mao decided to enter the war.

Units of the People’s Liberation Army, known as the Chinese People’s Volunteers (CPV), entered North Korea and the Korean War in late October 1950. A month later, the CPV attacked the U.S. and UN forces and drove them back into South Korea. It was a military catastrophe—the longest retreat in U.S. military history. The front eventually stabilized and South Korea never fell, but the need to keep the war limited was indelibly imprinted on most U.S. decision-makers. They avoided another all-out invasion of North Korea in order to

23. John Pay, “The Battlefield Since 1945,” *Warfare in the Twentieth Century*, Eds. Colin McInnes and G. Sheffield (London: Unwin Hyman, 1988), 215.

24. Chen Jian, *China’s Road to the Korean War: The Making Sino-American Confrontation* (New York: Columbia University Press, 1994).

mitigate the risk of greater Chinese intervention, or, worse, Soviet intervention and the broader conflict it might entail. Likewise, after 1950, U.S. military commanders and political leaders refused to permit major amphibious assaults on North Korea. Several amphibious assaults were planned but never implemented. In mid-1951, General James Van Fleet, commander of the Eighth Army, wanted to complement a major advance with an amphibious assault into North Korea. General Matthew Ridgway, MacArthur's replacement, vetoed the plan, partly because the risk of escalation was too great.²⁵ Less than a month later, Van Fleet proposed an offensive to the waist of the Korean Peninsula, along with an amphibious assault against Wonsan. Ridgway denied the request on the same grounds.²⁶ In late 1952, General Mark Clark, Ridgway's successor, created a plan to invade North Korea and China because cease-fire negotiations were stalled. Once more, an amphibious option was included in the offensive plan. However, President-Elect Dwight Eisenhower believed the plan would unnecessarily escalate the war and refused to consider it. More aggressive operations against North Korea, including a possible amphibious operation, were finally approved in May 1953 as a possible option (NSC 147) if the Communists continued to stall in cease-fire negotiations. The breakthrough in negotiations in early June 1953 averted the implementation of NSC 147.²⁷

The Anglo-French amphibious assault on Port Said in 1956 also demonstrated how the risk of escalation constrained amphibious assaults. In July 1956, Gamal Abdel Nasser, President of Egypt, nationalized the Suez Canal. The United Kingdom and France decided to launch an amphibious assault to retake the canal. Operation Musketeer, the

25. United States Army Military History Institute (USAMHI): Ridgway Papers, Box 1, Conference between General Matthew Ridgway and General James Van Fleet, 31 May 1951.

26. USAMHI: Ridgway Papers, Box 21, Ridgway to Van Fleet, Admiral C Turner Joy, and Lieutenant General George Stratemeyer, 19 June 1951. National Archives and Records Administration (NARA): RG349, 631:5/41-42/07-01, Van Fleet to Ridgway, 23 September 1951. NARA: RG349, 631:5/41-42/07-01, Brigadier White to UNC Chief of Staff, 13 Oct 1951.

27. Liddell Hart Center for Military Archives (LHCMA): Records of the Joint Chiefs of Staff, MF54, NSC 147, 15 Apr 1953.

initial invasion plan, envisaged an assault on Alexandria, followed by an advance into Cairo and the seizure of the canal.²⁸ The small size of the assault force and concerns about escalation caused planners to reduce Musketeer in scope. “Musketeer Revised” set the attack directly on Port Said, at the mouth of the canal. Planners later confined the invasion to the area around the Suez Canal and abandoned the plan to capture Cairo.²⁹ Even these modifications did not prevent escalation. The Soviet Union was attempting to build a closer relationship with Egypt in order to gain influence in the Middle East. When the assault took place in November 1956, Soviet General Secretary Nikita Khrushchev threatened intervention. At the same time, U.S. President Eisenhower angrily took steps to coerce his allies. Consequently, the British and French called off the offensive despite military progress. In other words, the amphibious operation had escalated the conflict, compelling an end to hostilities.

The risk of escalation also constrained amphibious operations in the Vietnam War. U.S. policy guidelines explicitly sought to avoid a widened war with the People’s Republic of China (PRC) or Soviet Union and, therefore, did not permit an invasion of North Vietnam. John McNaughton, an influential policy-maker in the Defense Department, expressed these fears when he wrote in a draft presidential memorandum in 1967: “To U.S. ground actions in North Vietnam, we would expect China to respond by entering the war with both ground and air forces. The Soviet Union could be expected in those circumstances...to generate a serious confrontation with the United States at one or more places of her choosing.”³⁰ According to a presidential directive in 1968, the U.S. war effort would be a failure if the conflict escalated into direct confrontation with the Soviet Union or PRC.

28. Robert Jackson, *Suez: The Forgotten Invasion* (Shrewsbury: Airlife, 1996), 26.

29. André Beaufre, *The Suez Expedition, 1956* (New York: Praeger, 1969), 49, 92.

30. *Pentagon Papers: The Defense Department History of U.S. Decision-making on Vietnam*, Senator Gravel Edition (Boston: Beacon Press, 1974), 485, 532–533.

Nevertheless, the U.S. command in Vietnam (MACV) planned a number of major amphibious landings against North Vietnamese forces near the demilitarized zone. For example, in 1968, MACV planned Operation Durango City. The goal was to amphibiously assault North Vietnam's coastline near the demilitarized zone. In 1972, in reaction to the North Vietnamese Easter Offensive, Admiral John McCain, Commander of the U.S. Pacific Fleet, proposed several amphibious assaults on North Vietnam. Neither plan was implemented: Washington did not want to risk Chinese or Soviet intervention, let alone the casualties of a major assault.³¹

Aside from the new strategic context, the Cold War witnessed a substantial number of amphibious assaults in regions of low salience to superpower interests. For example, the United States was willing to overthrow the Communist government of Grenada because it was a marginal Soviet interest. Additionally, the United States launched amphibious assaults in South Vietnam where the Soviet Union and PRC were unlikely to intervene. Indeed, about 15 percent of all U.S. Marine battalion-size operations in Vietnam were amphibious.³² To give further examples, the Chinese Communists conducted a large, if disastrous, amphibious assault on the island of Quemoy in 1949, at the end of the Chinese Civil War. More successfully, during the 1971 India-Pakistan War, India landed over a battalion in East Pakistan. And in reaction to political turmoil, the Turks landed several divisions in Cyprus in 1974.

New operational approaches to amphibious warfare

In World War II, warfare was conventional. Operations revolved around defending territory or destroying the enemy. In amphibious warfare, defending forces always engaged the assault force and tried to repel the attack, whether through a forward, mobile, or in-depth

31. Joseph Alexander and Merrill Bartlett, *Sea Soldiers in the Cold War: Amphibious Warfare, 1945–1991* (Annapolis: Naval Institute Press, 1995), 56.

32. Micheal Clodfelter, *Warfare and Armed Conflicts: A Statistical Reference to Casualty and Other Figures, 1618–1991*, vol. 2 (London: MacFarland & Co., 1992), 1314.

defense. During the Cold War, unconventional warfare gained prominence in the form of guerrilla warfare. Unconventional operations, such as terrorism, guerrilla warfare, or civil unrest, eschew the dogma of defending terrain and fighting large battles. Guerrilla warfare is based on avoiding battles with the enemy, and, instead, wearing him down through ambushes and minor raids. Against concentrated offensives, including amphibious assaults, guerrillas evade contact rather than confront superior firepower. The primary example of the interaction between amphibious and guerrilla warfare is the Vietnam War.

The U.S. Marine Corps conducted 62 amphibious assaults in battalion or regimental strength in the South Vietnam between 1965 and 1969. The vast majority were ineffective and involved no significant contact with the enemy. Without contact, the operational objective of destroying enemy units could not be accomplished. Ironically, operational tempo accelerated dramatically. Facing scant enemy resistance, assault forces usually moved directly from disembarkation to advancing toward the elusive operational objective: finding the guerrillas.

Operation Double Eagle exemplifies amphibious operations in the Vietnam War. The aim of Double Eagle was the annihilation of an enemy concentration—Viet Cong and North Vietnamese Army—on the boundary between I and II Corps. Two battalion landing teams would conduct a seaborne assault, with a third team in reserve afloat. Meanwhile, South Vietnamese forces would drive against the Viet Cong and North Vietnamese Army from inland. The idea was to envelop and trap the enemy. The Marines prepared thoroughly for the assault, even conducting a practice landing in the Philippines. The assault actually took place on 28 January 1966. No significant contact occurred. The Marines faced only intermittent small arms fire and light firefights inland as the Viet Cong and North Vietnamese dispersed. On 17 February, the Marines returned to their amphibious ships.

Throughout the Vietnam War, the nature of amphibious warfare prevented the Marines from surprising and engaging the Viet Cong or North Vietnamese Army. Guerrillas could easily detect an imminent

amphibious assault. Naval gunfire, beach and landing zone reconnaissance, air support, and the visibility of surface vessels all forewarned of an amphibious assault. Additionally, amphibious forces could not react quickly to good intelligence of an enemy's location. The process of building supplies and deploying the amphibious fleet slowed reaction time. Admiral Roy Johnson, commander of the Pacific Fleet, stated:

The excessive time involved in planning and coordinating with the MACV levels resulted in completely stale intelligence. Furthermore, by the time MACV had completed his all important coordination and alerting of ARVN [South Vietnamese Army] forces...we had also completely spooked the VC and they had flown the coop.³³

Once deployed, amphibious battalions or regiments were too unwieldy to catch the mobile Viet Cong and North Vietnamese. In terms of battlefield tactics, successful counterinsurgency requires small units engaged in monotonous patrolling in order to both collect intelligence and surprise guerrillas. The Marines deployed entire battalions, often slowed by armored vehicles. Stockpiling of supplies ashore for such large units further limited mobility, particularly during the first crucial moments after a landing when the possibility of surprise needed to be exploited.

Cold war assault and area denial tactics

Amphibious warfare experienced three major tactical changes during the Cold War. First, new means of ship-to-shore movement increased the mobility and depth of amphibious operations. Second, the advent of precision-guided munitions introduced a new threat to amphibious fleets, the anti-ship missile. Third, precision-guided munitions also increased the destructiveness of air power.

33. Jack Shulimson and Charles Johnson, *U.S. Marines in Vietnam: The Landing and the Buildup, 1965* (Washington, DC: Headquarters, U.S. Marine Corps, 1984), 203.

Ship-to-shore movement

Ship-to-shore movement increased in mobility and depth during the Cold War because of the fielding of the helicopter. Unlike airborne drops, helicopters could deploy units accurately behind enemy lines. From there, units could immediately move to encircle enemy forces, capture key points, or conduct search and destroy missions.

The U.S. Marine Corps began experimenting with helicopters in the late 1940s. General Roy Geiger, commander of the III Amphibious Corps during World War II, observed the Bikini atomic bomb tests in 1946. He recognized the potency of atomic weapons against an orthodox amphibious assault. General Alexander Vandegrift, U.S. Marine Corps Commandant, was impressed with Geiger's observations and created a high-level board to review amphibious warfare. The board suggested using helicopters to land forces behind enemy defenses in dispersed formations. Thereby, ship-to-shore movement would be less vulnerable to atomic weapons.³⁴

The Korean War (1950–1953) demonstrated the viability of the helicopter as a transport vehicle. After the war, the U.S. Marine Corps again considered the future of amphibious warfare. In 1956, General Lemuel Shepherd, Commandant, instructed Major General Robert Hogaboom to conduct a study on improving Fleet Marine Force performance. Hogaboom focused on analyzing how, first, limited warfare and, second, helicopters would affect amphibious operations. The Hogaboom Board doubted that amphibious warfare would take place in a potentially nuclear environment, such as Europe. Therefore, it suggested that the Marines mold themselves into a flexible force able to engage in Third World conflicts. Helicopter aviation development was advised, to enhance mobility. The ability to outmaneuver an opponent through striking behind his front would provide for greater decisiveness and lower casualties.³⁵

34. Ian Speller, *The Role of Amphibious Warfare in British Defence Policy, 1945-1956* (London: Palgrave, 2001), 113.

35. Alexander and Bartlett, 29-30.

Along with helicopters, the Marine Corps called for new specialized helicopter carriers. Old Essex fleet carriers were first converted for the task until new vessels, the Iwo Jima (LPH) class, could be built. The British also incorporated helicopters into their amphibious forces in the early 1950s.

The Anglo-French assault on Port Said was the first helicopter landing in amphibious operations. After seaborne elements had landed at Port Said, helicopters lifted the 45 Royal Marine Commando into immediate combat. The expeditious deployment of a full battalion contributed to the quick breakout from the Port Said beachhead.³⁶ Subsequently, the Royal Navy and Royal Marines fully embraced helicopters in amphibious operations and decided to convert two light carriers, HMS *Bulwark* and *Albion*, into helicopter carriers.

The tactical nature of amphibious assaults evolved significantly in the Vietnam War. Marine amphibious forces, known as special landing forces, operated from the amphibious task group deployed off Vietnam. It usually consisted of an LPH, such as *Iwo Jima*, and two or three LSDs and LSTs. Helicopters played the dominant role in ship-to-shore movement. The depth of amphibious assaults expanded beyond the beach to several miles inland. Helicopters increased the potential for decisive results, if the North Vietnamese or Viet Cong could be found. Amphibious forces could attempt to strike an enemy strongpoint or immediately surround their forces. In Operations Starlite, Beau Charger, and Belt Tight, U.S. Marine battalions used helicopters to surround enemy forces.

In Operation Starlite, the U.S. Marines Corps' first heliborne amphibious operation, the 7th Regimental Landing Team conducted an amphibious assault against the 1st VC Regiment. Marine intelligence reported on 21 July that the regiment was massing near the village of Van Truong, for an attack on the Marine base of Chu Lai. General Walt, commander of the Marine force in Vietnam, decided to pre-empt the Viet Cong attack. An amphibious landing would encircle and annihilate the 1st VC Regiment. Amphibious assault forces were used because the helicopters and landing craft provided

36. Jackson, 104.

the mobility necessary to intercept the enemy. The assault force consisted of three battalions. One battalion would land at a beach nearly three miles south of Van Truong. Helicopters would lift another battalion into three landing zones several miles inland. In all, the landings formed nearly a four-mile swath surrounding Van Truong from the south and east. A separate company would advance on the ground and cut off Van Truong from the north. Once ashore, the amphibious assault force would sweep northward through Van Truong. The seaborne landing took place at 0630 on 18 August 1965 and the helicopter landings during the following hour. Several companies met stiff resistance. By the second day, though, the 1st VC Regiment had largely dispersed and retreated to the south. Even though its target escaped, Operation Starlite had demonstrated the potential of helicopters for encircling enemy forces.³⁷

Helicopters suffered from two limitations. First, they could not transport heavy equipment. Therefore, most amphibious assaults still required a seaborne component. For example, in Operation Starlite, landing craft lifted tanks and heavy supplies into the lodgment.³⁸ Second, helicopters were highly vulnerable to ground fire. Even light infantry posed a serious threat to a heliborne landing. Several helicopters were shot down during amphibious operations in the Vietnam War and the invasion of Grenada. Particularly devastating, 3 helicopters were shot down and 28 were damaged, of 34 total, during an amphibious assault on Quang Tri City in July 1972.³⁹

Another major innovation in ship-to-shore movement during the Cold War was the invention of high-speed landing craft, specifically the hovercraft (LCAC). Hovercraft enables troops and supplies to deploy to the beach from much greater distances and at a much faster rate than previously. They are a basis for over-the-horizon assaults.

37. Shulimson and Johnson, 70-71.

38. O.F. Peatross, "Application of Doctrine: Victory in Van Truong Village," *Vietnam: The Naval Story*, ed. Frank Uhlig (Annapolis: Naval Institute Press), 159.

39. Dale Andradé, *Trial by Fire: The 1972 Easter Offensive, America's Last Vietnam Battle* (New York: Hippocrene Books, 1997), 219.

But, despite being deployed by the U.S. Marine Corps in the 1980s, hovercraft have not yet been used in an amphibious assault; thus, we cannot do a historical analysis of their effectiveness.

Threats to surface vessels

During most of the Cold War, there were few threats to surface vessels in amphibious operations. Defending forces either lacked the capability or were unwilling to strike surface vessels. Some defenders, such as North Korea, the Viet Cong, Grenada, and Egypt, could not challenge the amphibious force's air, surface, and undersea supremacy. Other defenders, such as China and North Vietnam, had the capability to strike surface vessels. However, the risk of escalation constrained them from doing so.

From 1945 to 1973 the primary threat to surface vessels originated from mines. The Inchon landing barely pre-empted extensive North Korean minelaying. The effect that mines might have had on the Inchon landing was witnessed a month later at Wonsan where mine-sweeping delayed the landing until after South Korean troops had already taken the city. Mines were also a potential threat to the Anglo-French assault on Port Said. Although the beaches at Port Said were not mined, several nearby beaches were. Mines remain a threat today. In the Gulf War, the Iraqis sowed a deep minefield along their coast and in the Persian Gulf, and mines seriously damaged USS *Princeton* and *Tripoli*.

In the 1970s, states began fielding anti-ship missiles. These posed a serious new threat to surface vessels. The missiles were highly accurate and could be launched from beyond visual range. The threat manifested itself fully in the 1982 Falklands War. In that conflict, the Royal Navy suffered the heaviest ship losses of any navy since World War II. Two ships were lost to Argentine Exocet anti-ship missiles: HMS *Sheffield* and *Atlantic Conveyor*. Following the amphibious assault on 21 May 1982, the Argentine aircraft attacked the Royal Navy Task Force unloading supplies in San Carlos. Bombs sank another four vessels: HMS *Galahad*, *Ardent*, *Antelope*, and *Coventry*. The British had sought to supply ground forces directly from the ships offshore. Air strikes caused the British to decide this was too dangerous without complete sea control. Instead, they conformed to the traditional

method of stockpiling supplies on the beach. Furthermore, the intensity of air strikes forced the British to pull vulnerable ships, some still laden with supplies, from the amphibious operating area.

The Falklands War begged the question whether amphibious assaults could occur at an acceptable cost. Anti-ship missiles made littoral operations more complicated than at any time since World War II. If one of the task force's two aircraft carriers had been disabled or sunk, the assault probably would have been called off entirely. But in general the threat from anti-ship missiles during the Cold War should not be exaggerated. In the Falklands War, the British had neither air superiority nor early warning aircraft. Under similar circumstances, the threat posed by German and Japanese aircraft, surface vessels, and warships during World War II had exacted a much greater price. For example, at Guadalcanal, the U.S. Navy lost 24 ships to Japanese air and surface attacks out of about 100 vessels.⁴⁰ Comparatively, the British lost only 2 ships to Exocet anti-ship missiles, plus the 4 to bombs, out of over 50 vessels.⁴¹ Admittedly, larger numbers of anti-ship missiles would have caused greater ship losses.

Firepower support

The amount of firepower backing amphibious assaults decreased in the Cold War. Amphibious assaults no longer included vast armadas of bombers and battleships. Instead of numerous battleships and hundreds of bombers, a handful of cruisers, destroyers, and fighter-bombers supported most assaults. For example, only two destroyers, a cruiser, 20 aircraft, and a few artillery batteries supported Operation Starlite. In Vietnam, the U.S. Navy's Gunfire Support Unit contained one cruiser and five destroyers.⁴² After Vietnam, few warships carried more than a single 4.5-inch or 5-inch gun. The change

40. *The Landings in the Solomons*, 7-8 August 1942 (Washington, DC: Naval Historical Center, 1994), 8-9.

41. Anthony Cordesman and Abraham Wagner, *The Lessons of Modern War: The Afghan and Falklands Conflict*, vol. 3 (Boulder: Westview Press, 1990), 261.

42. Micheal Clodfelter, *Vietnam in Military Statistics: A History of the Indochina Wars, 1772-1991* (London: MacFarland & Company, 1995), 63.

was largely a result of navies focusing upon missiles as the new offensive and defensive weapon. However, the demand for naval gunfire remained. Naval gunfire supported amphibious and ground-based infantry throughout the Vietnam War. In the Falklands, naval gunfire provided firepower otherwise lacking for the light British ground forces. For example, it enabled small teams of British special forces (SAS and SBS) to contain numerically superior Argentine observation units during the initial landing.

Several amphibious operations in the Cold War displayed a marked emphasis on air power as a means of avoiding losses in ground combat. The Anglo-French assault on Port Said in 1956 was an early precursor of the current reliance on air power. A prolonged bombing of Egyptian military targets preceded the invasion plan as a means of reducing casualties to the assault force and the Egyptian civilian population. It sought to break the Egyptian will to fight. Approximately 500 French and British aircraft bombed Egypt from 31 October until the landing on 5 November 1956, targeting airfields, key military installations, army formations, supply lines, and coastal defenses. The amphibious assault took place only after potential opposition became negligible and the Egyptian Air Force had been destroyed.⁴³

In the 1970s and 1980s, the advent of precision-guided munitions increased the potency of air power. A single weapon could now destroy targets previously too small to be accurately hit. Precision-guided munitions first had an impact in the 1972 Easter Offensive during the Vietnam War. U.S. bombers deployed guided missiles and bombs that destroyed difficult targets, such as bridges, small roads, and SAM batteries. Air power played a key role in South Vietnamese amphibious counteroffensives near Quang Tri City. South Vietnamese Marine Corps battalions mounted a series of amphibious assaults against numerically superior North Vietnamese infantry and armored units. Survival in this high-intensity combat environment would have been impossible without air support. For example, during the key amphibious assault on Quang Tri City, massive and timely tactical air support, as well as naval gunfire, saved a South Vietnamese Marine

43. Jackson, 26, 69-70, 75.

Corps battalion from North Vietnamese counterattacks. In general, U.S. tactical aircraft and B-52 Arclight strikes preceded each attack. Landings were carefully coordinated with the strikes.⁴⁴ Most of the tanks destroyed or damaged in the fighting around Quang Tri City and Hue had been hit by precision-guided munitions.⁴⁵ Precision-guided munitions also increased the effectiveness of tactical air support during the Falklands War. Laser-guided bombs successfully hit Argentine entrenchments. In general, Harrier strikes substituted for naval gunfire and artillery support, which was insufficient.⁴⁶

Amphibious warfare, 1983–2002

Changes in the strategic, operational, and tactical context of warfare

There has been no major amphibious assault since the United States invaded Grenada in 1983. In the meantime, the strategic, operational, and tactical context of warfare has changed substantially. However, certain strategic and operational constraints upon amphibious warfare during the Cold War are still constraints today. And many of the important developments in technology that characterize current warfare first occurred during the Cold War. Therefore, related lessons of the Cold War should still apply.

The strategic context of warfare changed dramatically in 1991 when the Soviet Union fell apart. Since then, the United States has been the sole superpower. In theoretical terms, the international system has moved from bipolarity to unipolarity. Without a major competitor, the United States can fight in more areas of the world without risking

44. CNA Operations Evaluation Group Study 1035, *Defense of Hue and Quang Tri City, the 1972 NVN Invasion of MR-1*, Center for Naval Analyses, 3 Apr 1975.

45. Benjamin Lambeth, *The Transformation of American Air Power* (Cornell: Cornell University Press, 2000), 27.

46. Earl Tilford, "Air Power Lessons," *Military Lessons of the Falkland Islands War: Views from the United States*, eds. Bruce Watson and Peter Dunn (Boulder: Westview Press, 1984), 45. Cordesmann and Wagner, 316.

escalation. There is now greater scope for decisive amphibious operations. In the 1990s, the United States undertook aggressive military operations in regions that had been vulnerable to superpower confrontation during the Cold War, such as the Middle East or the Balkans. Nevertheless, nuclear weapons remain a latent constraint on amphibious warfare. Assaulting an actual nuclear power is still prohibitively risky. As the number of nuclear powers grows and those powers assert influence over their interests, nuclear weapons will exercise greater restraint on decisive amphibious operations.

The operational context of warfare began to change during the Cold War, when unconventional operational concepts, such as guerrilla warfare and terrorism, became more common. After 1991, unconventional warfare maintained and perhaps even increased its prominence. Wars in Chechnya, the Balkans, Somalia, Sierra Leone, East Timor, and Afghanistan were often marked by small bands of fighters conducting raids and guerrilla-type activities. None of these conflicts definitively entailed guerrilla warfare. However, they shared an important characteristic with guerrilla warfare: the combatants, when opposed by concentrated conventional forces, chose to avoid battle. They adopted alternative operational approaches, often described as “asymmetric warfare,” in order to slowly eat away at the will of their opponents rather than engage in direct battle. British strategist Lawrence Freedman wrote:

These alternative strategies reflect those that the weak have consistently adopted against the strong: concentrating on imposing pain rather than winning battles; gaining time rather than moving to closure; targeting the enemy’s domestic political base as much as his forward military capabilities; relying on his intolerance of casualties and his weaker stake in the resolution of the conflict; and playing on a reluctance to cause civilian suffering, even if it restricts military options. In short, whereas stronger military powers have natural preference for decisive battlefield victories, the weaker are more ready to draw the civilian sphere into the conflict, while avoiding open battle.⁴⁷

47. Lawrence Freedman, *The Revolution in Strategic Affairs*, Adelphi Paper 318 (Oxford: Oxford University Press, 1998), 41.

For amphibious warfare, asymmetry represents a continuation of the experiences of the U.S. Marines in Vietnam. Traditional amphibious assaults could not destroy guerrillas in that conflict. Asymmetric warfare will probably have similar effects on amphibious warfare today.

Post-cold war amphibious tactics

The tactical context of warfare has witnessed the greatest amount of change since 1983. In general, the incorporation of new technologies, particularly precision-guided munitions and improved equipment for receiving and collecting information, has increased military effectiveness. This is often termed the “Revolution in Military Affairs” (RMA). Supposedly, better battlefield information and more precise weapons enable unparalleled decisive victories at a low cost.⁴⁸

Precision-guided fire support and information technology

The advent of precision-guided munitions and new information technology magnified the destructiveness of air power. Land forces and ground targets are now susceptible to destruction by much more accurate weapons. The change in air power has implications beyond the tactical level. Increasingly, academics, military officers, and politicians view air power, instead of ground forces, as the decisive component of military force. The 1991 Gulf War, 1999 War in Kosovo, and 2001–2002 War in Afghanistan showcased the accurate use of air power to destroy conventional forces or coerce political leadership.⁴⁹ These victories begged whether ground forces are necessary to achieve political ends. If ground forces are not necessary, then amphibious warfare is also irrelevant. However, there is not yet sufficient historical evidence to conclude that air power can attain victory single-handedly. Significantly, the victories in the 1991 Gulf War and the 2002 Afghanistan War involved the major use of ground forces.

More destructive air power may also afford protection to dispersed ground operations. It might provide sufficient firepower support to allow dispersed ground forces to survive against mechanized

48. *Ibid.*, 11.

49. Lambeth, 1–11.

opponents. The Vietnamese Marine amphibious operations in 1972 and the current war in Afghanistan provide some support for this possibility. In the latter, small special forces teams received overwhelming and devastating firepower support from the air when attacked by superior Taliban and al-Qaeda forces. Nevertheless, further historical evidence is needed to confirm that dispersed operations are now feasible.

New information technology may also increase the effectiveness of amphibious operations through alleviating problems in command and control and intelligence. Such problems traditionally inhibited amphibious warfare from Gallipoli to Tarawa to Grenada. Computers, satellite communications, and networked command systems give commanders a more accurate picture of the battlefield. New information technology may provide better awareness of environmental conditions, enemy strength, and the location of friendly forces.⁵⁰ Again, there is insufficient historical evidence to confirm this claim.

Threats

The implications of the “Revolution in Military Affairs” are not universally positive for amphibious operations. Since the Falklands War, anti-ship missiles, one of the earlier precision-guided munitions, have been a major threat to littoral naval operations. The Exocet strike on USS *Stark* in 1987 and the Chinese Silkworm attack on USS *Wisconsin* in the 1991 Gulf War reconfirmed the danger that anti-ship missiles pose.

Ship-to-shore movement

The U.S. Marine Corps is trying to acquire a capability for over-the-horizon assaults. The realization of this capability depends upon the performance of new platforms to supplement the LCAC—the AAV and MV-22 Osprey. The new armored assault vehicle, the AAV, will be far superior in range and speed to the current AAV. The MV-22 Osprey will have more lift, greater range, and more durability than helicopters.

50. Lambeth, 160. Freedman, 21.

Anti-ship missiles largely created an impetus for over-the-horizon assaults. In such an assault, the surface fleet would remain distant from land-based aircraft and missiles while LCACs, helicopters, new MV-22 Ospreys, and new AAVs brought the landing force ashore. Thus, over-the-horizon assaults would greatly improve the defensive potential of the fleet supporting amphibious operations.

However, the offensive potential of amphibious forces would not improve. Amphibious assaults would have the same basic framework that they had in the Cold War. Some units would be inserted via the air to envelop the enemy while others would move ashore aboard seaborne landing craft. Helicopters and Ospreys would be susceptible to traditional threats from surface-to-air missiles, small arms fire, and anti-aircraft artillery. Troops inserted into enemy territory via helicopter would still lack armored support, and hence would be vulnerable to enemy fire. Helicopter or Osprey operations do provide a high potential for decisive operations; however, they are not new types of platforms but rather a result of the innovations of the Cold War.

Conclusion

The history of amphibious warfare since 1941 has several implications for OMFTS. In general, our analysis supports the contention that the current tactical environment creates a potential for greater decisiveness. The OMFTS family of warfighting concepts takes into account foreseeable changes to fielded equipment and associated tactics, and attempts to exploit them. For example, helicopters and precision-guided munitions increased the potential decisiveness of amphibious warfare, as shown by amphibious assaults in Operation Starlite, the battle for Quang Tri City, and the Falklands.

However, strategic and operational constraints exist upon amphibious warfare and are likely to mitigate the decisiveness of future amphibious operations. The OMFTS concept paper does not address these constraints. The paper gave three likely targets for amphibious operations: non-state actors engaged in violence and creating instability in a littoral area, regional powers possibly armed with nuclear weapons, and a rising superpower. The Cold War demonstrated that

amphibious warfare would be of mixed utility against such foes. First, the United States would be unlikely to mount an amphibious assault directly against a regional power with nuclear weapons or a rising superpower. This is not to claim that amphibious warfare would be useless. The Cold War suggests that amphibious operations would be acceptable against a regional power without nuclear weapons or the marginal interest of a rising superpower. Second, the non-state actors perpetrating violence and instability in the world's littorals are proponents of asymmetric (unconventional) warfare. They evade encounters with U.S. forces, much like guerrilla warfare in the Vietnam War. OMFTS, though, focuses on conventional maneuver and engaging the opponent decisively. The Marines' experience in Vietnam showed that such an operational strategy is not tailored to an unconventional environment.

In conclusion, history does not disprove the concept of OMFTS. Amphibious warfare has become more decisive and akin to maneuver warfare. The concept may not be universally applicable, though. Amphibious warfare will need to be conducted in appropriate circumstances when there is a minimal risk of escalation. Additionally, further tactics, techniques, and procedures will need to be implemented for combating unconventional warfare.

Key factors in the success of OMFTS

In this section, we attempt to isolate factors key to the successful execution of OMFTS. We analyze two fundamental components of OMFTS: the minimization of operational pause, and amphibious assaults on broad and deep fronts.

Operational pause

We define operational pause as “the period between landing (H-hour or L-hour) and advancing from the beachhead toward the operational objective.” The minimization of operational pause is a foremost priority of OMFTS. The purpose of this sub-section is to suggest what has caused operational pause historically and how it has been overcome.

The causes of operational pause

We analyzed the causes of operational pause through examining quantifiable data and case studies of amphibious warfare. The concept papers for OMFTS and STOM assert that the primary cause of operational pause is the time required to build adequate supplies ashore. The OMFTS concept paper reads:

For most of the 20th Century, the usefulness of sea-based logistics was limited by the voracious appetite of modern landing forces for such items as fuel, large caliber ammunition, and aviation ordnance. As a result, the options available to landing forces were greatly reduced by the need to establish, protect, and make use of supply dumps. Concerted efforts were delayed and opportunities for decisive action missed while the necessary supplies accumulated on shore.⁵¹

51. “Operational Maneuver From the Sea,” *United States Marine Corps Warfighting Concepts for the 21st Century* (Quantico: Concept Division, Marine Corps Combat Development Command, 1998), I-10.

The STOM concept paper elaborates on related causes of operational pause. Historically, amphibious forces have been unable to build up combat power from an initial assault capability to sufficient strength to allow “seamless” maneuver toward the operational objective.

Our historical analysis does not support the concept papers’ assumption that operational pause has been predominantly a function of the buildup of supplies ashore. We found an additional factor associated with operational pause: the length and character of enemy resistance. The concept papers make only passing reference to relationship of operational pause to enemy resistance. The papers recognize the need to exploit weak points, destroy enemy defenses, and receive long-range fire support.⁵² For example, one tenet of STOM is to leverage all intelligence sources in order to locate enemy gaps and bypass enemy strong points while en route to the objective. However, the concept papers do not discuss enemy resistance as a driving force behind operational pause.

Quantitative data for operational pause

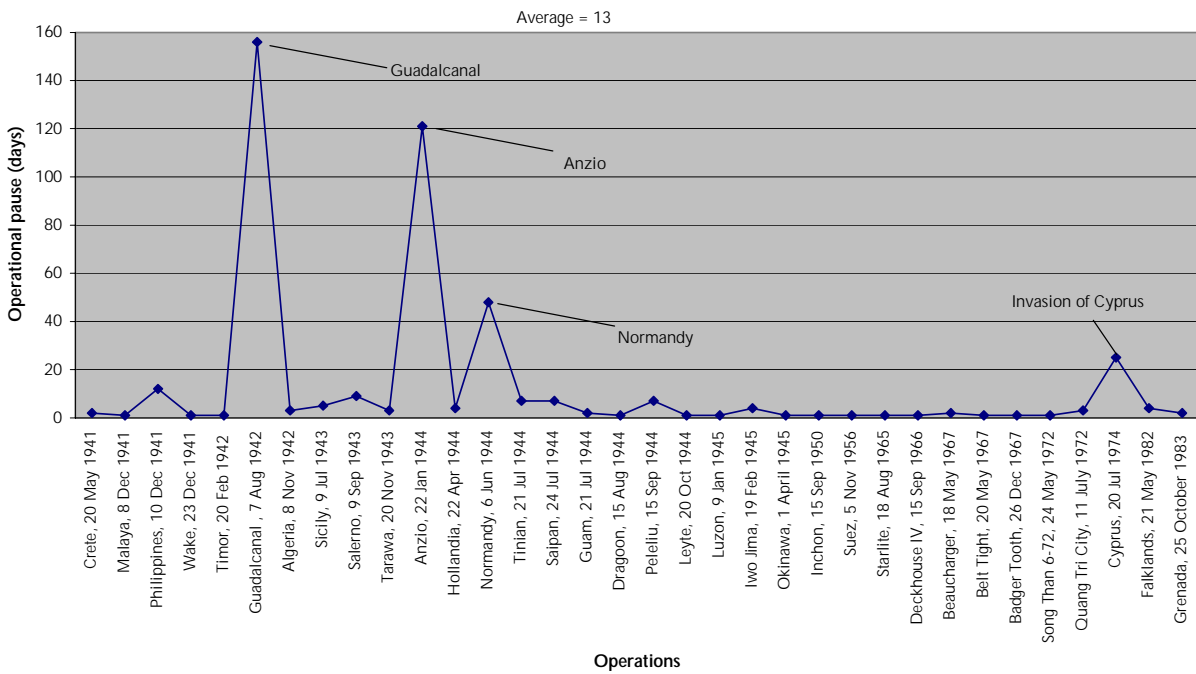
We measured operational pause for 34 amphibious operations, shown in table 2 and figure 4. We show the number of days between landing (H-hour and L-hour) and significant advance from the beachhead or landing zone. “Significant advance” is a subjective determination of the point at which the attacking force is moving forward in greater than marginal increments toward the inland operational objective. Operational pause ranged from only 1 day to a high of about 160 days for the operations we considered. A pause of 1 day, the minimum, meant the assault unit landed on D-day and was able to make a substantial advance on either that or the following day.

52. “Advanced Expeditionary Fire Support--The System After Next,” *United States Marine Corps Warfighting Concepts for the 21st Century* (Quantico: Concept Division, Marine Corps Combat Development Command, 1998) VI-4, VI-9.

Table 2. Operational pause, 1941 to present

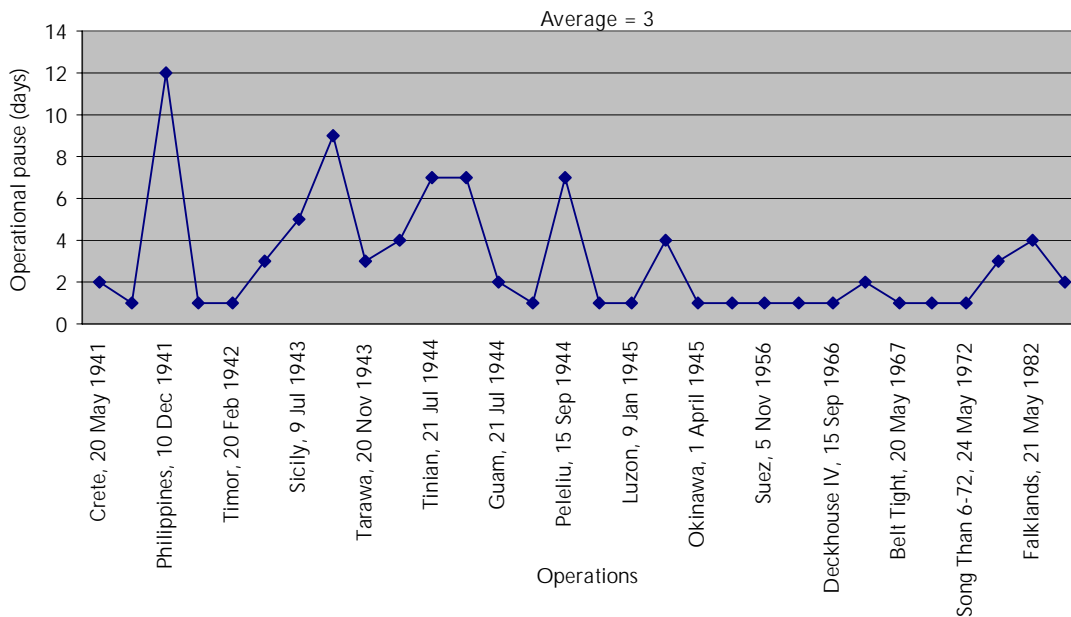
Operation	Pause (days)	Operation	Pause (days)
Crete	2	Peleliu	7
Malaya	1	Leyte	1
Philippines	12	Luzon	1
Wake	1	Iwo Jima	4
Timor	1	Okinawa	1
Guadalcanal	156	Inchon	1
Algeria	3	Suez	1
Sicily	5	Starlite	1
Salerno	9	Deckhouse IV	1
Tarawa	3	Beau Charger	2
Anzio	121	Belt Tight	1
Hollandia	4	Badger Tooth	1
Normandy	48	Song Than 6-72	1
Saipan	7	Quang Tri City	3
Guam	7	Cyprus	25
Tinian	2	Falklands	5
Anvil Dragoon	1	Grenada	2

Figure 4. Operational pause since 1941



The availability of historical data within secondary sources was the primary criterion for selecting operations. We gathered data for as many operations as possible within the time constraints of the project. We lacked time to conduct archival research and measure operational pause for every amphibious operation since 1941 (there were hundreds in the Pacific War alone). Thus, the data set is composed of prominent amphibious operations and does not include lesser-known and smaller assaults. In particular, numerous small-scale assaults from the Pacific War and Vietnam War are absent from the data set. Figure 4 shows that the operational pauses for Guadalcanal, Anzio, Normandy, and Cyprus fell well outside the trend for historical amphibious landings. Figure 5 shows that minus those four outliers, the average length of operational pause is 3 days. Guadalcanal, Anzio, and Normandy had particularly long operational pauses. The reasons for these long pauses are unique to each case and cannot be quickly explained here. In addition to determined enemy resistance, other factors were important, including command decisions, lack of air superiority, and the mobility of the assault forces ashore.

Figure 5. Operational pause since 1941 (minus extreme cases)



We then compared operational pause to three parameters. The parameters were chosen to test how strongly operational pause is connected to enemy resistance. Intuitively, the buildup of supplies ashore seems unlikely to be the primary cause of operational pause, given that most amphibious assaults also encountered heavy enemy resistance that limited forward movement. The analysis does not apply statistical techniques. These quantitative comparisons are simply meant to show that a variable other than the length of the supply buildup ashore may be linked to operational pause. They do not prove that enemy resistance is the primary cause of operational pause.

We would have also preferred to compare operational pause to the supply buildup ashore. Unfortunately, the historical data we reviewed did not allow us to distinctly discern the point at which the initial deployment of combat forces ashore transitioned to the general off-load period (the administrative movement of the remaining landing force supplies embarked on amphibious shipping to the lodgment). Therefore, we could not identify a suitable measurement to serve as the proxy for the supply buildup ashore.

Three parameters measure enemy resistance: the force ratio of the initial assault force to the local defending force; the defender's operational strategy; and enemy ground resistance encountered. The last parameter is defined as the length of time enemy forces actively fought for control of territory in the vicinity of the beachhead.

The force ratio divides the number of friendly troops that landed on the first day of an amphibious assault by the number of opposing ground troops in the vicinity of the landing (i.e., units that might have been deployed to defend the beachhead or landing zone by the end of D-day). Table 3 shows the force ratios we calculated for 31 amphibious assaults.⁵³ When comparing the force ratio to the operational pause, we expected operational pause to decrease as the numerical superiority of the assault force increased. Cases such as Peleliu and Saipan in which the attackers had a low numerical superiority and were forced to fight for the beachhead suggested this would be the case. The data does not seem to support our intuition (Guadalcanal, Anzio, and Normandy notwithstanding). Viewing the data in figure 6, high force ratios do not necessarily imply low operational pause. For example, the assault forces at Salerno, Anzio, and the Falklands enjoyed a strong numerical superiority yet experienced fairly long operational pauses. Our case studies will show the lack of an apparent relationship between high force ratios and low operational pause is due to the large number of additional factors affecting operational pause.

53. Estimates for a force ratio were not available for Operation Beau Charger, Operation Belt Tight, and the Turkish invasion of Cyprus.

Table 3. Force ratios for amphibious operations, 1941 to the present

Operation	Initial assault force	Initial defense force	Force-on-force ratio	Defensive doctrine	Pause (days)
Crete	7,500	40,000	0.2	Forward	2
Malaya	17,000	2,500	6.8	Forward	1
Philippines	57,000	28,000	2.0	Forward	12
Wake	800	500	1.6	Forward	1
Timor	5,600	2,100	2.7	Forward	1
Guadalcanal	17,000	3,600	4.7	Mobile	156
Algeria	61,000	20,600	3.0	Forward	3
Sicily	150,000	43,400	3.5	Mobile	5
Salerno	55,000	15,600	3.5	Mobile	9
Tarawa	18,000	4,800	3.8	Forward	3
Anzio	36,000	1,000	36	Mobile	121
Hollandia	53,000	18,000	2.9	Forward	4
Normandy	155,000	70,000	2.2	Forward	48
Saipan	20,000	32,000	0.6	Mobile	7
Guam	20,000	21,000	1.0	Forward	7
Tinian	17,400	9,000	1.9	Forward	2
Dragoon	60,000	34,000	1.8	Forward	1
Peleliu	9,000	10,500	0.9	In-depth	7
Leyte	132,400	16,000	8.3	In-depth	1
Luzon	68,000		10.0 ¹	In-depth	1
Iwo Jima	30,000	21,000	1.4	In-depth	4
Okinawa	116,000	2,600	44.6	In-depth	1
Inchon	13,000	2,500	5.2	Forward	1
Suez	22,000	6,000 ²	3.7	Forward	1
Starlite	5,000	1,500	3.3	Guerrilla	1
Deckhouse IV	1,100	1,000 ³	1.1	Guerrilla	1
Badger Tooth	1,800	1,000	1.8	Guerrilla	1
Song Than 6-72	1,300		10.0 ⁴	Forward	1
Quang Tri City	840	1,000 ⁵	0.8	Forward	3
Falklands	3,500	80	43.8	In-depth	5
Grenada	1,500	1,300	1.2	Forward	2

¹This figure is an estimate based on the fact minimal opposition was met at the beachhead.

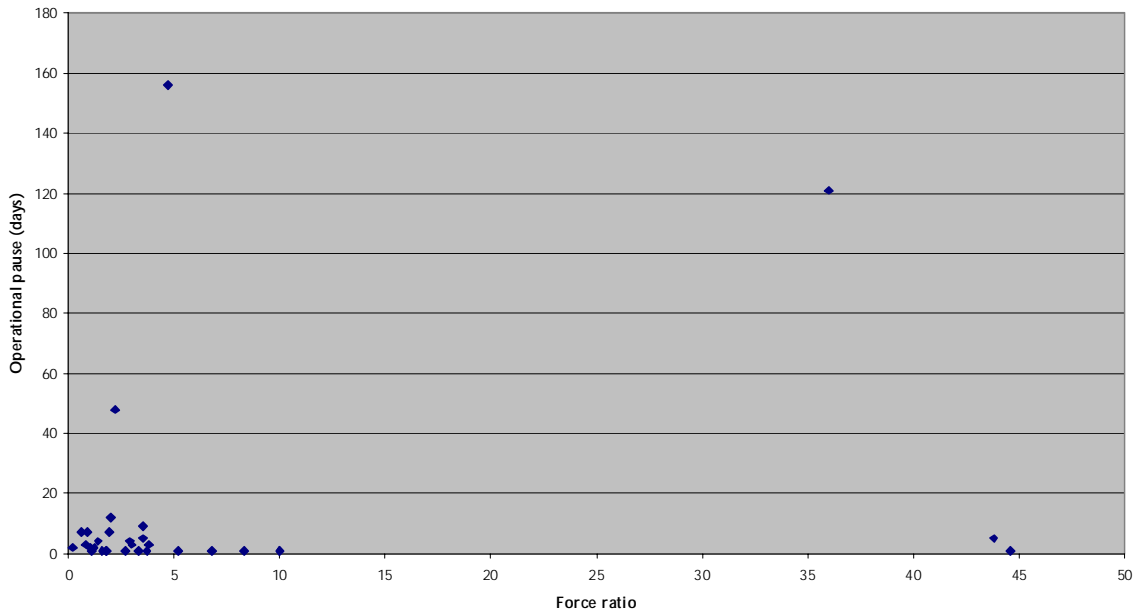
²This figure is an estimate based on Egyptian casualties and known forces in the vicinity of the Suez Canal.

³This figure is an estimate. Sources state the defending force was elements of the 90th NVA Regiment.

⁴This figure is an estimate. The landing was largely unopposed.

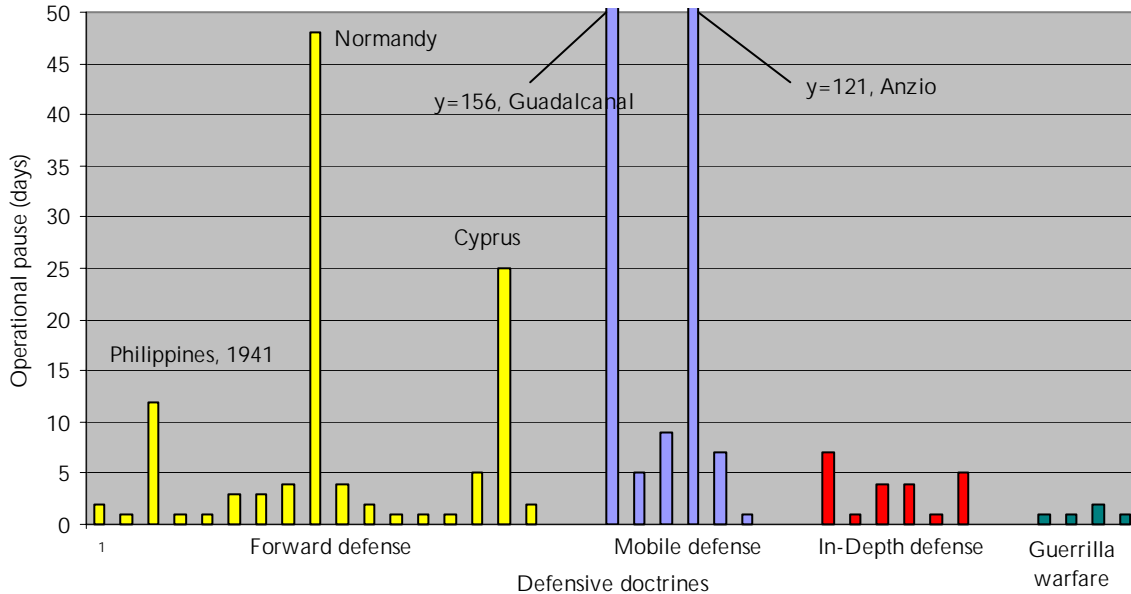
⁵This figure is an estimate. Sources state the defending force was elements of the 48th NVA Regiment.

Figure 6. Force ratio vs. operational pause



To further test enemy resistance, we compared operational pause to the different defensive doctrines used against amphibious assaults: forward defense, mobile defense, in-depth defense, and guerrilla warfare. We expected that doctrines that defended the beaches—mobile and forward defense—would induce a longer operational pause than those that abandoned the beaches—in-depth defense and guerrilla warfare. Indeed, length of operational pause decreased per defensive doctrine in the following order: mobile defense, forward defense, in-depth defense, and guerrilla warfare. Figure 7 shows that doctrines involving closer defense of the beaches, forward and mobile defense, had longer operational pauses on average whereas the two doctrines that did not defend the beaches, in-depth defense and guerrilla warfare, had shorter operational pauses on average. Our findings are not meant to imply that attacking forces, by default, reach the inland objective sooner against an in-depth defense. Simply, the delay at the beachhead is, on average, shorter.

Figure 7. Operational pause of defensive doctrines

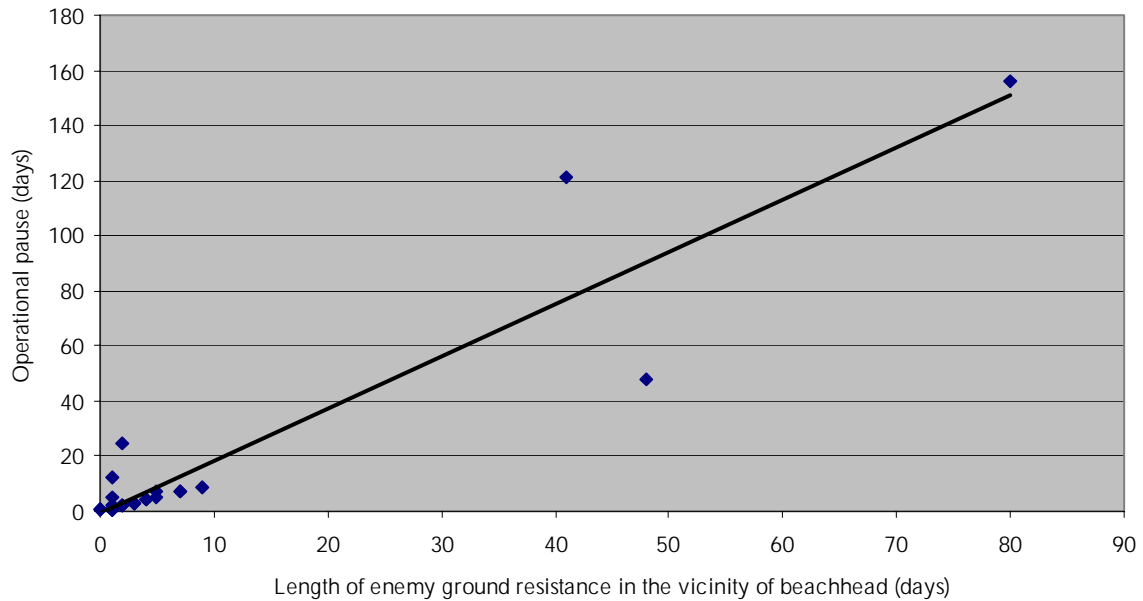


The length of significant enemy ground resistance refers to the number of days that the defending ground forces actively fought for control of territory in the vicinity of the beachhead (table 4). For example, if assault forces remained engaged with defending units to gain control of the beachhead or the enemy was launching counterattacks, then significant ground resistance existed. If the front was static and combat was not intense, then significant enemy ground resistance did not exist. We compared the length of significant enemy ground resistance to the length of the operational pause. The results of this comparison are highly compelling. On average, operational pause grew as enemy ground resistance lengthened (figure 8). Granted, the length of *significant* enemy resistance is fairly subjective. Even the most tranquil front usually witnesses raids and patrols. Nevertheless, the results are persuasive in showing that sustained enemy resistance (regardless of the force ratio) was frequently present throughout an operational pause.

Table 4. Length of significant enemy ground resistance

Operation	Pause (days)	Enemy resistance (days)
Crete	2	2
Malaya	1	1
Philippines	12	1
Wake	1	1
Timor	1	1
Guadalcanal	156	80
Algeria	3	3
Sicily	5	5
Salerno	9	9
Tarawa	3	3
Anzio	121	41
Hollandia	4	4
D-Day	48	48
Saipan	7	7
Guam	7	5
Tinian	2	2
Dragoon	1	1
Peleliu	7	7
Leyte	1	1
U.S. Luzon	1	1
Iwo Jima	4	4
Okinawa	1	0
Inchon	1	1
Suez	1	1
Starlite	1	1
Deckhouse IV	1	1
Beau Charger	2	1
Belt Tight	1	0
Badger Tooth	1	0
Song Than 6-72	1	1
Quang Tri City	3	3
Cyprus	25	2
Falklands	5	1
Grenada	2	2

Figure 8. Length of enemy ground resistance vs. operational pause



Overall, our comparisons with the quantitative data suggest that, historically, enemy resistance is related to the length of operational pause. However, the only parameter that associates strongly with length of operational pause is the length of significant enemy ground resistance.

We recognize the limitations of our quantitative comparisons. Namely, an analysis of this nature does not convey the complex environment of amphibious warfare. It does not account for contributing factors such as surprise, firepower, air power, and combined arms tactics to the outcome of an operation. The comparisons also involved a significant contradiction: relatively high force ratios often did not entail shorter operational pauses. This suggests that, although larger forces had enough combat power to start moving inland, the assault force opted to wait until most, if not all, of the tactical combat force embarked aboard amphibious shipping had transited ashore, increasing the duration of the operational pause. In sum, despite its limitations, our analysis indicates that enemy resistance, as well as the buildup of supplies ashore, affects operational pause.

Case studies of operational pause

We analyzed four historical cases to gain greater insight into the dynamics and causes of operational pause. Our primary purpose was to determine whether the buildup of supplies ashore or the quality and character of enemy resistance was the dominant factor in operational pause. To do so, we selected four cases that experienced operational pause. We sought to isolate the effect of the supply buildup ashore on operational pause by varying the level of enemy ground resistance throughout the cases. Enemy ground resistance was defined qualitatively as “the length and intensity of fighting near the beachhead or landing zone.”

If the supply buildup ashore caused operational pause, the assault force should not have advanced quickly even against minimal enemy ground resistance. Rather, it should have secured the lodgment while supplies came ashore and then advanced only after sufficient supplies had been stockpiled there. The cases should include evidence to this effect.

On the other hand, if enemy ground resistance caused operational pause, then the landing force should have advanced rapidly when enemy resistance was low or minimal. If opposition was light, there should be little reason for an operational pause. Furthermore, cases with high enemy ground resistance should include evidence that the operational pause was the result of that resistance and not the need to build up supplies ashore.

Case #1: The amphibious assault on Quang Tri City

The first case study is the South Vietnamese Marine Corps’ assault on Quang Tri City in July 1972. The battle included an amphibious heli-borne assault on a North Vietnamese supply line. This was a case in which enemy ground resistance was high. The resistance caused a three-day operational pause.

The operational objective of the amphibious assault on Quang Tri City was to block one of the North Vietnamese lines of communication to the city, running north near the coast. The assault was meant to add a maneuver element to the frontal assault on the city. General Ngo Quang Truong, the South Vietnamese corps

commander, told the U.S. advisor, Major General Howard Cooksey: "The attack must be a bold one that reaches the very rear area as quickly as possible."⁵⁴ Truong took advantage of U.S. amphibious assets to insert a South Vietnamese Marine Corps battalion while two other battalions advanced toward the objective on foot.

The assault met very heavy ground resistance. On 11 July 1972, following six hours of U.S. naval, artillery, tactical air, and B-52 bombardment, the South Vietnamese Marine Corps battalion landed three miles inland, astride the North Vietnamese line of communication north of Quang Tri City. However, being a key point, the operational objective was not an enemy weak spot. It was defended by elements of the 48th NVA Regiment, including tanks. The North Vietnamese had abandoned guerrilla warfare by this point in the war and were following Soviet doctrine for mechanized warfare. Thus, they were capable of creating a very intense combat environment. Exact enemy numbers are unknown, but the 840 South Vietnamese marines probably met at least 1,000 North Vietnamese soldiers.⁵⁵

The North Vietnamese put up a ferocious resistance at the landing zone. Surface-to-air missiles and heavy machine-guns shot down four U.S. Marine helicopters and damaged 28 more. One helicopter landed nearly on top of a North Vietnamese T-54 tank, and another landed on the roof of a North Vietnamese command post. On the ground, the South Vietnamese Marine Corps battalion engaged in a pitched battle against the entrenched 48th NVA Regiment. The Vietnamese marines were unable to move forward. North Vietnamese counterattacks nearly annihilated the marine battalion. Only massive and timely U.S. tactical air, artillery, and naval gunfire support saved

54. Dale Andradé, *America's Last Vietnam Battle: Halting Hanoi's 1972 Easter Offensive* (Lawrence: University of Kansas Press, 2001), 175.

55. Dale Andradé, *Trial by Fire: The 1972 Easter Offensive, America's Last Vietnam Battle* (New York: Hippocrene Books, 1997), 220.

it.⁵⁶ The South Vietnamese Marines did not secure their position and cut the North Vietnamese supply route until 14 July.⁵⁷

North Vietnamese resistance in the amphibious assault on Quang Tri City most likely caused the operational pause. Historical sources provide no indication that the need to build supplies ashore caused it. The significance of this result is reinforced by the fact that the South Vietnamese had low supply needs. The landing force was merely a battalion, and it was directly assaulting the operational objective. The prospect of a long supply buildup was actually small. The fact an operational pause occurred nonetheless weakens any argument that the supply buildup ashore is the primary cause of operational pause. Regardless of the supply situation, the South Vietnamese marines could not have captured their operational objective without driving back the North Vietnamese.

Case #2: The Battle of Tarawa

The infamous Battle of Tarawa provides our second case study. On 20 November 1943, the U.S. Marines assaulted the island in the opening phase of the U.S. campaign across the Central Pacific. This was a case in which enemy ground resistance was high. Again, enemy resistance, interacting with problems in intelligence, ship-to-shore movement, and firepower support, caused the operational pause.

Notably, the U.S. Marines had a high force ratio in the Battle of Tarawa yet still experienced operational pause. Eighteen thousand U.S. Marines assaulted the atoll of Tarawa; they faced only 4,800 Japanese defenders. Additionally, the Imperial Japanese Navy was over a thousand miles away and just 46 Japanese aircraft were in range of Tarawa. Thus, the U.S. Navy had undisputed control of the sea and air.

56. Peter Wilson, *Defense of Hue and Quang Tri City: The 1972 NVN Invasion of MR-1*, Operations Evaluation Group Study 1035, Center for Naval Analyses, 3 Apr 1975), 15.

57. Ngo Quang Truong, *The Easter Offensive of 1972* (Washington, DC: Center for Military History, 1980), 67.

Factors not incorporated in the force ratio neutralized the American numerical advantage. The Japanese had converted Tarawa into an island fortress. A reef and the island of Betio encircled the lagoon of the Tarawa atoll. The Japanese were located on Betio. A coral reef surrounded Betio and strengthened the defense by preventing landing craft from beaching at low tide. Mounting a forward defense, the Japanese emplaced coastal guns, planted mines, dug entrenchments, sited interlocking fields of fire, and constructed concrete obstacles. Tarawa also had a unique tidal pattern, of which the Americans had insufficient intelligence. The atoll has a “dodging tidal pattern,” meaning that a neap tide flows irregularly every day.⁵⁸

In the actual assault, a low neap tide uncovered the coral reef and prevented the landing craft from reaching Betio. Marines were forced to disembark 500–600 yards from the beach and wade forward, exposed to Japanese artillery and small arms fire. The air and naval bombardment had failed to suppress the dug-in defenders. Naval guns had shelled the island for two and a half hours, too briefly to destroy the Japanese defenses. Furthermore, the bombardment was not coordinated to protect the infantry wading ashore. Air strikes were equally ineffective, partly because pilots were inexperienced at close air support. Consequently, the Marines suffered very heavy casualties and the Japanese nearly repulsed the assault. Japanese artillery destroyed landing craft and tanks. The infantry was pinned in the lagoon. Nevertheless, superior numbers and firepower enabled the Marines to grasp a beachhead by nightfall. Furious fighting continued around the beachhead for three days before the Marines could move forward to clear the island.

At Tarawa, enemy ground resistance created an operational pause through a complex interaction of factors that spanned beyond quantitative measurements of air, sea, and ground superiority. The quality of naval gunfire and air support, the Japanese defensive preparations, and geography played a key role in creating operational pause. Historical sources do not cite the need to build supplies ashore as a

58. Michael Lindberg and Daniel Todd, *Brown-, Green-, and Blue-Water Fleets: The Influence of Geography on Naval Warfare, 1861 to the Present* (Westport: Praeger, 2002), 159.

cause. This finding is reinforced by the fact the Marines had low supply needs. The operation lasted just 3 days, and Tarawa was too small for a massive lodgment. The prospect of a long supply buildup was actually small. Like the Quang Tri City case, the fact that an operational pause occurred nonetheless weakens any argument that supply buildup ashore is the primary cause of operational pause.

Case #3: The Falklands War

The previous two case studies involved an amphibious assault that experienced a high amount of enemy ground resistance. In both cases, the dynamics of overcoming enemy resistance on the ground seem to have been the primary cause of operational pause. The next two cases test this result by considering cases in which landing forces faced minimal enemy ground resistance. If overcoming ground resistance is the primary reason for operational pause, such cases should witness a rapid advance with little operational pause. This, in fact, occurred in several amphibious operations, such as the U.S. assaults on Okinawa, Leyte, and Luzon. However, other cases involved an operational pause even though the attacker faced minimal ground resistance, particularly the 1982 Falklands War and the 1974 Turkish invasion of Cyprus. These cases lend credence to the argument that the buildup of supplies ashore causes operational pause.

The British amphibious assault in the 1982 Falklands War faced minimal enemy ground resistance. Nevertheless, a five-day operational pause occurred because of the interaction of Argentine air strikes and the need to build up supplies ashore.

The initial British assault force, the 3rd Commando Brigade, encountered very minimal Argentine resistance at the landing beaches. Indeed, the British possessed a force ratio of 43.8. The British commanders had been determined to exploit an enemy weak spot and land against as little opposition as possible. Brigadier Julian Thompson, commander of the 3rd Commando Brigade, and Major-General Jeremy Moore, commander of the ground force, had established the importance of hitting an enemy weak spot, when they were planning the attack with Admiral John Fieldhouse, the Royal Navy Fleet Commander. Thompson wrote in his book *No Picnic*:

We were taken to see Admiral Fieldhouse. We both made two points. First, that a head-on assault in the vicinity of Port Stanley, or anywhere else that was strongly held, should be avoided. The British did not possess the equipment to make this possible. This was agreed. Second, it was vital that air superiority, at least over the beachhead area, was achieved before any landing was attempted. This we were promised.⁵⁹

Avoiding the Argentine concentration of forces around Port Stanley, the capital of the Falklands, the British landed on the opposite side of the island of East Falkland at the beaches adjacent to San Carlos Water. Thompson undertook certain tactical methods to facilitate surprise. The landing was conducted at night, with no preparatory bombardment. Also, diversionary/spoiling attack was mounted with the SAS (British commandos) and naval gunfire against an Argentine reserve force at Darwin, over 20 miles to the south.

By dawn, Thompson wanted to control the high ground surrounding the beachhead in order to be in a strong position to fight off Argentine air and ground attacks. A defensive air umbrella would be set up with Rapier surface-to-air missiles.

The initial landing on 21 May met little resistance. Forty Argentines defended the entry point to San Carlos Water. The SBS (British commandos) and naval gunfire attacked and defeated the Argentines as the first wave of the main assault embarked in landing craft. Another forty Argentines at Port San Carlos scattered when the first wave came ashore. The heaviest losses were two helicopters shot down by Argentine small arms fire.

In spite of the minimal Argentine ground resistance, the British did not move forward. Rather, the 3rd Commando Brigade secured a lodgment around San Carlos Water. The operational pause was the result of three interacting factors.

First, the British partly expected an Argentine attack. They were somewhat uncertain of Argentine dispositions immediately following the landings. Thompson believed that large numbers of Argentines

59. Julian Thompson, *No Picnic* (London: Cassell, 2001), 13.

could be in the area of San Carlos Water. Therefore, he disposed British ground forces to defend the lodgment against possible counterattacks.

Second, the true battle was actually occurring offshore. Argentine aircraft mounted 54 sorties against the British task force in San Carlos Water. The British lost four ships on 21 and 22 May. Although the British continued landing operations, the entire assault force was not ashore until the end of 22 May.⁶⁰

Third, the battle for air supremacy created a situation in which the British needed to build up supplies ashore. The British had originally planned to supply the advancing 3rd Commando Brigade via sea basing. Helicopters were to have transported supplies directly from the fleet to the units ashore. The difficult air situation forced Thompson to abandon this plan. He knew that without air superiority, the 3rd Commando Brigade's supply lines would be vulnerable to Argentine air strikes once it moved forward from the air defense umbrella surrounding San Carlos Water. The brigade depended upon helicopters to transport supplies, which were vulnerable to Argentine propeller-driven aircraft and small arms fire. Even without the air contest, the 16 helicopters available for logistical lift at this point were barely sufficient to support the brigade. They were absorbed in simply moving supplies from the fleet to the beaches. Sufficient lift to support units farther afield would not be available until supplies were built up ashore. Thompson wrote: "Other than pushing out patrols, there was no point in the Brigade moving out of the beachhead until a substantial part of its bullets, beans and fuel was ashore, and achieving this would use up most of the medium helicopters and all of the landing craft for days to come."⁶¹ The loss of *Atlantic Conveyor* on 25 May, with three Chinook helicopters aboard, further complicated the logistical situation. The operational pause continued until 26 May, when Royal

60. Anthony Cordesman and Abraham Wagner, *The Lessons of Modern War: The Afghan and Falklands Conflicts*, vol. 3 (Boulder: Westview Press, 1990), 253-254.

61. Thompson, 61.

Navy Fleet headquarters ordered Thompson to cut short the buildup and advance on Port Stanley.

The need to build up supplies ashore was clearly the dominant cause of operational pause for the British amphibious assault in the Falklands War. However, the lack of air superiority also encouraged the cautious stockpiling of supplies. Therefore, enemy resistance played a role, albeit secondary, in creating operational pause.

Case Study #4: The Turkish invasion of Cyprus

The fourth case study, the Turkish invasion of Cyprus in 1974, again involved minimal enemy ground resistance. The Turkish assault had many characteristics of OMFTS: helicopter and airborne units landed deep inside the area of operations; ship-to-shore movement included an over-the-horizon component; and the offensive plan pitted Turkish strength against Greek Cypriot weakness. However, the invasion also had an operational pause of 25 days. The decision to build up supplies ashore in the lodgment caused the operational pause.

On 15 July 1974, the military junta of Greece sponsored a coup of the Government of Cyprus. Cyprus was divided into Greek and Turkish communities. Both communities had strong ties with their mother countries. Turkey viewed the coup as a threat both to the Turkish Cypriot community and to its own national security. Accordingly, Turkey decided to invade Cyprus.

The initial objective of the Turkish invasion was to unify the primary Turkish communities, in Kyrenia (a port) and Nicosia, in a single bridgehead. On the morning of 20 July 1974, Turkish units deployed from naval vessels and directly from mainland Turkey, 40 miles away, in a three-pronged assault on northern Cyprus. Airborne forces dropped into northern Nicosia; helicopters inserted troops to seize the mountain pass connecting Nicosia and Kyrenia; and Turkish marines made a seaborne landing five miles west of Kyrenia. The marines later joined with the heliborne force. The follow-on 50th Infantry Regiment cleared Kyrenia. Turkish supply and transport ships unloaded their cargo at the port. No supplies were to be stockpiled at the beachhead. By the end of the day, 6,200 Turkish soldiers and 40 tanks had arrived on Cyprus.

In the following days, the Turks secured most of their tactical objectives.⁶² They faced minimal resistance. The weak Greek Cypriot forces were surprised and overwhelmed. However, Nicosia's airfield was not taken, because of the presence of British peacekeepers. As a result, more supplies than expected needed to be shipped into Kyrenia. The port facilities could not handle the influx and the Turks were forced to stockpile supplies ashore at the beachhead. To do so, Turkish forces pushed back nearby Greek Cypriot forces in difficult fighting. Meanwhile, the supply difficulties prevented the Turkish units from receiving sufficient ammunition and fresh water. Fighting continued until 23 July, when a UN cease-fire took effect.

The Turks abided by the cease-fire until 14 August 1974. In essence, this represented a 25-day operational pause. The Turks faced minimal initial Greek Cypriot opposition and could have pressed forward if they had not needed to receive supplies and reinforcements. Indeed, some historians claim that the Turks agreed to the cease-fire because their ammunition was almost exhausted.⁶³ From 23 July to 14 August, the Turks reinforced their position with 40,000 men and 260 tanks. On 14 August, the Turks attacked and captured 40 percent of the country within 2 days.

The Turkish invasion of Cyprus suffered an operational pause due to the need to build up supplies ashore. There was minimal Greek Cypriot resistance, yet offensive operations ceased in order to build supplies and reinforcements ashore. No historical sources (in English) cite Greek Cypriot resistance as playing a role in the pause.

Summary of case study and quantitative data for operational pause

The case studies and quantitative data underline the importance of both enemy resistance and the buildup of supplies ashore to operational pause. The relevance of the supply buildup ashore as a cause of

62. Patrick Townsend, "Airborne Operations and Amphibious Warfare, Cyprus, 1974," *Assault from the Sea: Essays on the History of Amphibious Warfare*, Ed. Merrill Bartlett (Annapolis: Naval Institute Press, 1983), 372–374.

63. Adrian Burke, "The Turkish invasion of Cyprus: A forerunner of OMFTS," *Marine Corps Gazette*, vol. 84, no. 3 (March 2000), 81–89.

operational pause is reinforced. An operational pause occurred in two cases with low enemy ground resistance. If enemy resistance is the predominant cause of operational pause, a pause should not have occurred in these cases. The landing force should have advanced directly from the beachhead to the operational objective. Although these results involve but two cases, they lend credence to the argument that the supply buildup ashore is a cause of operational pause.

The case studies and the quantitative comparisons also suggest that enemy resistance is a factor in operational pause. The quantitative data implies that the relationship between operational pause and the length of enemy ground resistance is strong. Furthermore, defensive doctrines involving resistance at the beachhead had a longer operational pause, on average than, doctrines that resisted inland. In the two case studies with high enemy ground resistance, that resistance in fact caused the operational pause. No indications were found that the supply buildup ashore played a role in these cases.

Additionally, the case studies supplement our basic quantitative findings and give a better impression of the complexity of amphibious operations. In particular, the case studies explain why high force ratios did not always associate with low operational pause. Force ratios merely measure the balance of men on the ground and are a narrow indicator of the strength, length, and character of enemy resistance. They do not measure air superiority, fortifications, firepower support, defensive doctrines, or a commander's expectations of enemy counterattacks. These factors played a role in creating enemy resistance in the case studies. Furthermore, the case studies show that factors unrelated to the supply buildup ashore or enemy resistance affected operational pause, such as tidal patterns, intelligence, and political cease-fires.

Given these results, sea basing alone cannot be expected to minimize operational pause. OMFTS must also address the key dynamic of decisively overcoming enemy resistance on the ground, in the air, and at sea if "seamless" maneuver is to be accomplished.

Overcoming enemy resistance and the supply buildup

In order to determine how to overcome enemy resistance and the need to build up supplies ashore, we analyzed three case studies in which operational pause had been minimized: Inchon, Port Said, and Operation Starlite. By doing so, we identified historical approaches for the implementation of OMFTS. We chose these cases because they had a short operational pause and were on the same scale as likely U.S. Marine amphibious operations today. Moreover, in terms of focusing on decisive action, the three assaults exemplify OMFTS.

Inchon

The Inchon landing, 15 September 1950, was one of the most decisive military strokes of the Cold War. MacArthur crafted the operational plan around striking directly at Seoul, the most important road and rail hub in Korea. Thereby, the bulk of North Korean armies to the south would be cut off and subject to annihilation. The campaign itself had a very high operational tempo as the 1st U.S. Marine Division advanced directly and rapidly on Seoul. MacArthur and the Marines averted an operational pause through two actions: facilitating the buildup of supplies ashore, and targeting an enemy weak spot.

First, the context of the assault was conducive to reducing the length of time required to build up supplies ashore. Preparation for the Inchon landing took less than two months. The X U.S. Corps, the total landing force, was barely two divisions strong. Therefore, there was neither the time to buildup nor the need to have a huge logistical stockpile. The staff of the Navy task force had calculated that the Marines would need 3,000 tons of supply to hold through the first night. By comparison, 107,450 tons of equipment came ashore on the first day of the landings at Leyte in World War II. Furthermore, Inchon was a port. Even though the port had a low capacity, tanks, artillery, and service units could be quickly placed ashore, reducing the length of time needed for the logistical offload. In the actual battle, LSTs brought supplies directly into Inchon's rudimentary port facilities. By 22 September, 25,512 tons had been off-loaded.⁶⁴

64. Curtis Utz, *Assault from the Sea: The Amphibious Landing at Inchon* (Washington, DC: Naval Historical Center, 1994), 34, 40.

Second, MacArthur targeted a weak point in the North Korean dispositions. The 1st U.S. Marine Division encountered only moderate North Korean resistance at Inchon. To reinforce North Korean complacency, a diversionary landing was conducted south of Inchon, at Kunsan, two days before the actual invasion. Fortunately, reconnaissance prior to the assault was excellent and the X U.S. Corps had accurate estimates of North Korean strength.

In the planning for the landing, MacArthur assumed that the difficulty of attacking Inchon would cause the North Koreans to disregard it as a vulnerable point, thus increasing the potential for strategic surprise. The harbor had deep tidal shifts, high sea walls, a narrow channel, broad mudflats, and fortified islands. Ship-to-shore movement needed to be conducted through tidal “windows,” when the sea would be high enough for the landing craft to reach the shore. The initial assault force consisted of two Marine regiments. The first wave would land at dawn and capture the island controlling the harbor, Wolmi-do. The second wave would land at sunset. Inchon itself would then be assaulted. Thereafter, the 1st U.S. Marine Division would drive on to Seoul. Once secured, the 1st Marine Division and the follow-on 7th U.S. Division could block an enemy retreat from the south.

In the event, only 2,500 North Korean soldiers defended Inchon. They were unprepared for MacArthur’s combined arms assault. Aircraft had attacked Inchon for five days before the assault. Four cruisers and six destroyers had bombarded the port during the final two days. The assault on 15 September was a success: Wolmi-do fell and the Marines stormed through Inchon. The North Koreans fought for most of 15 September but retreated toward Seoul by nightfall. On 16 September, the two Marine regiments pressed on toward Kimpo Airfield and then to Seoul, 25 miles away. Air power, in addition to organic armor and artillery, supported the infantry. Despite some armored counterattacks and stubborn resistance in the city itself, the Marines advanced rapidly and captured Seoul by 29 September.

Ironically, the Inchon landing was not a surprise. News of the plans had leaked from MacArthur’s command in Japan to the news media. The Tokyo Press Club had termed the landing, “Operation Common

Knowledge.” Mao Zedong had even predicted the exact location of the amphibious assault. MacArthur was extremely lucky that the North Koreans had not reinforced and strengthened Inchon’s defenses.⁶⁵

The Suez Canal

The Anglo-French assault on Port Said from 5 to 6 November 1956 is usually associated with the debacle of the encompassing Suez Canal Crisis. The British and French ultimately withdrew in disgrace after requiring over three months to mount the assault. In spite of all this, the one-day ground operation was a model of overwhelming operational tempo. British and French units broke through a narrow and fortified defensive front to advance quickly toward securing the Suez Canal. By the cease-fire on 6 November, the British 2nd Parachute Regiment was 23 miles south of Port Said.

British and French political decision-makers considered Port Said the most expeditious landing point from which to secure the Suez Canal. However, assaulting a port would not be an easy task. Urban combat would be guaranteed from the outset. Worse, a narrow causeway ran from Port Said along the length of the canal. If the bridges to this causeway were not taken, the British and French would be trapped in Port Said. Additionally, the British and French did not have an overwhelming numerical advantage. Scarce landing craft, transport aircraft, and helicopters limited the size of the initial assault force. The British could transport only two Royal Marine commandos and two Parachute Regiment battalions in the first wave of the seaborne and airborne assaults. In total, the French and British deployed approximately two brigades. Against this, the Egyptians had over 3,000 men around Port Said, with equipment that included Soviet SU-100 tank destroyers. Further back, an Egyptian infantry division and armored brigade group (10,000 to 18,000 men) defended the Canal Zone as a

65. Edwin Simmons, *Over the Seawall: U.S. Marines at Inchon* (Washington, DC: Marine Corps Historical Center, 2000), 26.

whole.⁶⁶ British and French commanders feared that these formations would counterattack the landing force.

Three factors enabled the British and French to overcome these daunting obstacles and move forward with minimal operational pause. First, the commanding general, British General Charles Keightley planned an extensive and lengthy air campaign to suppress Egyptian defenses and undermine their will to fight. The air campaign was a means of mitigating the numerical limitations of the ground forces. He wanted to make the Egyptians incapable of any organized ground resistance. The air campaign began five days before landing. Five hundred French and British aircraft attacked military targets throughout Egypt, undeterred by Egyptian anti-aircraft guns and MiG-15 squadrons. They destroyed Egyptian airfields and crippled the Egyptian Air Force. The extended bombing coupled with the Israeli victory in the Sinai meant that Egyptian Army morale was very low by 5 November.

Second, the British and French paid special attention to logistics. They reduced the length and size of the supply buildup ashore through assaulting a port and focusing on a limited objective. As we noted in the second section of this report, the adoption of “Muskeeter Revised” and the change of the operational objective from Cairo to the Suez Canal eased logistical demands. Because the operation was shorter and more circumscribed, there was no need to offload mass amounts of supplies.⁶⁷ As in the Inchon case, the change in assault plans also reduced the length of time needed for the supply buildup. Heavy equipment as well as manpower could be off-loaded directly at Port Said. British LSTs moored along Port Said’s Casino Pier. Additionally, transport aircraft and helicopters landed at the airfield captured by the British 3rd Parachute Regiment. Twenty-two thousand men were ashore by the end of 6 November.

66. Robert Jackson, *Suez: The Forgotten Invasion* (Shrewsbury: Airlife, 1996), 42.

67. *Ibid.*, 40.

Third, the assault force implemented aggressive combined arms tactics in conjunction with a tactical envelopment. The combination of firepower and tactical maneuvering dislocated Egyptian resistance. The invasion plan envisioned a combined airborne and seaborne assault that would envelop Port Said. French and British airborne troops would seize the airfield near Port Said and capture the two bridges to the causeway. The bridges were vital to breaking out of Port Said quickly. Regarding the seaborne movement, two Royal Marine commandos would land astride Port Said's Casino Pier and establish a small beachhead until a small armoured unit disembarked. Then, they would break out to the south. Meanwhile, the French seaborne component would land at Port Fuad and advance. The airborne drops were eventually pressed forward to the night prior to the seaborne landing.

The amphibious plan was remarkably effective. The French and British paratroopers seized their tactical objectives in spite of difficult fighting, ensuring that the assault forces could break out of Port Said. In the 45 minutes before the seaborne landing, four destroyers shelled the beaches, neutralizing coastal defense guns. Tactical aircraft bombed Port Said during the final ten minutes. Under the continued protection of naval gunfire, the Royal Marines successfully secured the beachhead. Elements of the 6th Royal Tank Regiment, with Centurion tanks, disembarked and penetrated with the Royal Marines into Port Said. The Egyptians, though disorganized, resisted strongly within the town. SU-100 tank destroyers obstructed the 3rd Parachute Regiment's advance from the airfield. Nevertheless, the superior combat power and tactical skills of the French and British cracked the Egyptian resistance. Centurions broke through roadblocks and engaged tank destroyers. To speed operations, the British landed the 45 Royal Marine Commando via helicopter. At the end of the day, French and British troops were racing over the captured bridges and along the canal. The international crisis had now undermined the military success, though, and the British and French governments permitted a cease-fire to take effect on 7 November.

Operation Starlite

Operation Starlite exemplifies OMFTS. It was a precursor of both sea basing and the use of helicopter assets to strike inland and encircle

an opponent. In fact, Operation Starlite was one of the few helicopter and seaborne assaults of the Vietnam War that actually engaged the Viet Cong in a major battle. On 18 August 1965, the 7th Regimental Landing Team attacked and attempted to encircle the 1st VC Regiment. Even though the 1st VC Regiment ultimately escaped, the U.S. Marines maintained a high operational tempo throughout the operation. Three factors enabled them to do so.

First, Colonel Oscar Peatross, commander of the 7th Regimental Landing Team, specifically sought to avoid any operational pause. He forbade the establishment of a large logistics base at the beachhead. He did not want to lose mobility tying down troops defending a lodgment. Instead, he created perhaps the first example of sea basing. Supplies were stockpiled on an LSD's helicopter deck. Helicopters carried the supplies directly to the battalions from the LSD. Major Floyd Johnson, one of Peatross' staff officers, called the LSD "a large floating dump."⁶⁸

Second, superior firepower enabled the Marines to overcome difficult Viet Cong ground resistance. The 1st VC Regiment mounted a particularly staunch defense around a landing zone near the "fortified" village of An Cuong. The action prevented the Marines from advancing substantially toward Van Truong on the first day of operations. The Viet Cong ambushed infantry companies, shot down a helicopter, and surrounded an armored resupply column advancing from the beach. Heavy firepower support augmented the Marines' fighting power and helped drive the Viet Cong back. Artillery batteries at Chu Lai, two destroyers and a cruiser, and 20 aircraft provided the support. Eight tanks also accompanied the assault force.

Third, the primary reason that the Marines were able to advance on 19 August (the second day of operations) was neither Peatross' creative logistical planning nor firepower but the decision of the 1st VC Regiment to break contact and disperse to the south. The Marines swept through Van Truong and then searched the area of operations

68. Jack Shulimson and Charles Johnson, *U.S. Marines in Vietnam: The Landing and Buildup, 1965* (Washington, DC: Headquarters, U.S. Marine Corps, 1978), 82.

for the next five days. Despite meeting pockets of enemy, another engagement with the 1st VC Regiment did not transpire.

Attributes for success

Inchon, Port Said, and Operation Starlite provide several insights into how successful amphibious operations overcame the need to build up supplies ashore and enemy resistance with minimal operational pause.

Each assault used a specific means of reducing the drag of logistics. At Inchon and Port Said, directly attacking a port enabled the rapid offload of supplies. Port facilities meant that supplies could be unloaded at a faster rate and at a more secure location than on the beach. Hence, the ground forces could move forward faster. Operation Starlite presented a more innovative approach to dealing with supply. The U.S. Marines presaged OMFTS by attempting to transport supplies directly from ships to units ashore. Some historical evidence, therefore, exists that sea basing will reduce operational pause, as claimed by the OMFTS concept paper.

The three amphibious assaults overcame enemy resistance through superior firepower, aggressive combined arms tactics, and targeting enemy weak spots. Firepower was a means of both softening the enemy prior to a landing and supporting friendly ground forces in combat. Air power and naval gunfire suppressed the enemy in all three cases. None of the enemy units were equipped to respond to the level of firepower of the amphibious assault.

At both Port Said and Inchon, the stress placed on aggressive forward movement and combined arms tactics accelerated operational tempo. In each case, plans clearly emphasized aggressive tactics. Coordination with armor added shock power and mobility to each assault. Enemy positions were encircled and outflanked as ground forces infiltrated forward. Commanders accepted the risk of not consolidating their position on the beachhead and advancing before their supply line was totally secure. They simply decided not to tie their ground forces to a lodgment.

Of the three assaults, only the plan for Inchon explicitly sought to exploit an enemy weak spot. At Inchon, MacArthur's intention to attack the enemy at an unexpected point was fundamental to the small number of defenders facing the assault. Nevertheless, none of these amphibious assaults encountered truly heavy resistance. To some extent, each was facing a relative weak spot compared to previous amphibious assaults. This fact was intrinsic to their ultimate success. The enemy lacked the defensive capabilities of the German panzer divisions at Normandy or the Japanese fortifications at Iwo Jima. Attacking the North Korean Armored Division at Inchon would have been suicidal.

Amphibious assaults on an extended front

Operational pause was the first of two fundamental components of OMFTS that we analyzed. The second was extended front assaults. OMFTS envisages amphibious operations on an unprecedented depth and breadth. Instead of a single landing on a narrow one- to ten-mile front, amphibious operations will consist of multiple seaborne landings on a front hundreds of miles long and heliborne landings approximately 100 miles deep within enemy territory. The defender will be forced to counter penetrations over an impossibly large area. We term such operations "extended front assaults."

To study extended front assaults, we had to change our analytical focus. Operational pause is an effect caused by certain operational factors, such as the general offload of supplies and enemy resistance. But commanders *choose* to implement extended front assaults, believing that the resulting effects will benefit their operations. Accordingly, this section analyzes the historical effects of extending the assault front and compares them with the expected effects of OMFTS. Then, it identifies key attributes of successful extended front assaults.

The OMFTS and STOM concept papers claim that extended front assaults will have a positive effect on amphibious warfare. An attack on a broad and deep front will enable assault forces to create, locate, and exploit gaps or weaknesses in enemy defenses.⁶⁹ Self-contained formations will break through enemy defenses on multiple axes of advance and converge rapidly on the operational objective. Combat

will be avoided unless necessary in order to maximize mobility. Enemy defenses will be stretched by the amount of territory requiring defense. The STOM concept paper states: “By requiring the enemy to defend a vast area against our seaborne mobility and deep power projection, naval forces will render most of his force irrelevant.”⁷⁰ Thin defenses will increase the assault force’s latitude for maneuver.

Our review of 34 amphibious operations from 1941 to the present indicated that the depth of initial assaults (that is, the distance from the shore to the inland landing point) never exceeded 15 miles (table 5). We found no historical examples of operations in which assault forces moved directly to inland landing points 100 n.mi. from their amphibious ships. Moreover, we identified only three operations, shown in figure 9, that were executed over a front of 200 n.mi. or more.

Quantitative data for extending the assault front

For extended front assaults, we again examined quantitative data and conducted a case study analysis. The purpose of examining the quantitative data was: to identify historical examples of extended front assaults; and test the claim in the OMFTS concept paper that extending the assault front will have the positive effect of inducing the enemy to thin his defenses.

We gathered quantitative data on three parameters of amphibious operations: average number of forces per mile of front (force-to-front ratio), length of front, and percentage of the total defending force opposing the initial assault (defined later in our discussion). We did not use depth of amphibious assaults as a parameter, because of the small sample number of operations involving landings beyond the coast.

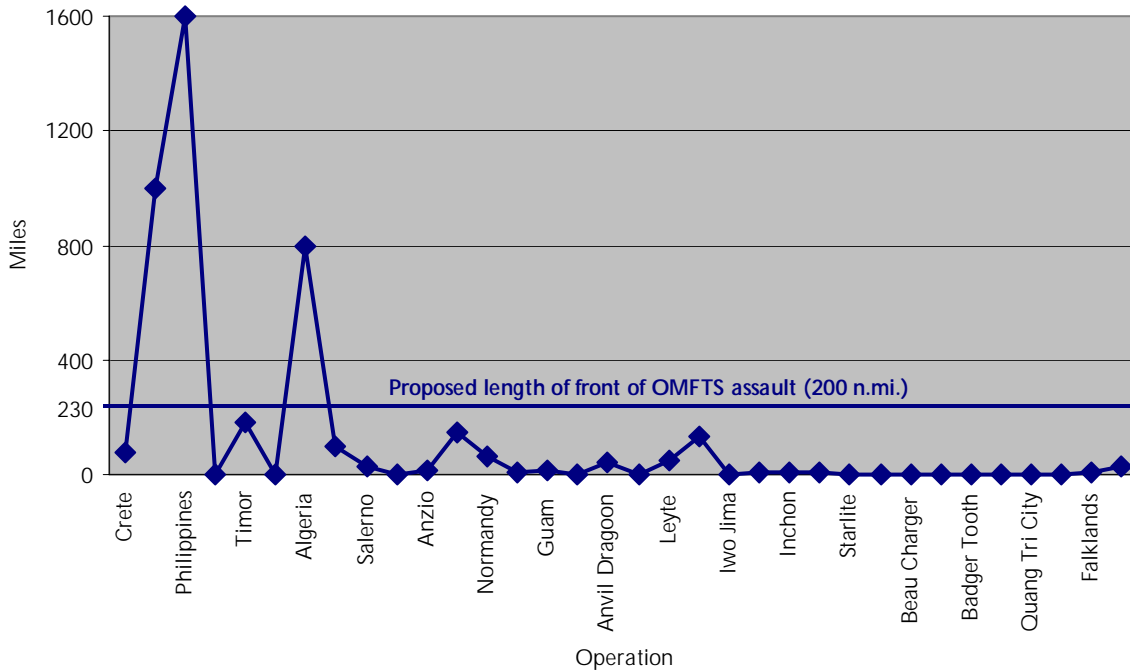
69. “Operational Maneuver From the Sea,” I-14.

70. “A Concept for Ship-to-Objective Maneuver,” II-7.

Table 5. Force-to-front ratios

Operation	Front (miles)	Initial assault force	Force-to-front ratio	Depth (miles)	Pause (days)	Set 1 or 2
Crete	75	7,500	100	1	2	1
Malaya	1,000	17,000	17	NA	1	1
Philippines	1,600	57,000	36	NA	12	2
Wake	1	800	800	NA	1	1
Timor	180	5,600	31	15	1	1
Guadalcanal	2	17,000	8,500	NA	156	1
Algeria	800	61,000	76	NA	3	2
Sicily	100	150,000	1,500	2	5	2
Salerno	30	55,000	1,830	NA	9	2
Tarawa	1	18,000	18,000	NA	3	1
Anzio	15	50,000	3,330	NA	121	2
Hollandia	150	53,000	350	NA	4	2
Normandy	60	155,000	2,580	8	48	2
Saipan	4	20,000	5,000	NA	7	1
Guam	15	20,000	1,330	NA	7	1
Tinian	2	17,400	8,700	NA	2	1
Dragoon	45	60,000	1,330	10	1	2
Peleliu	1	9,000	9,000	NA	7	1
Leyte	50	132,400	2,650	NA	1	2
Luzon	130	68,000	520	NA	1	2
Iwo Jima	2	30,000	15,000	NA	4	2
Okinawa	6	116,000	19,330	NA	1	2
Inchon	6	13,000	2,170	NA	1	1
Suez	7	22,000	3,140	3	1	1
Starlite	3	5,000	1,670	4	1	1
Deckhouse IV	1	1,100	1,100	6	1	1
Beau Charger	2	1,100	550	3	2	1
Belt Tight	1	1,100	1,100	8	1	1
Badger Tooth	1	1,800	1,800	1	1	1
Song Than 6-72	1	1,300	1,300	3	1	1
Quang Tri City	2	840	420	8	3	1
Cyprus	1	6,200	6,200	12	25	1
Falklands	5	3,500	700	NA	5	1
Grenada	25	1,500	60	< 0.5	2	1

Figure 9. Length of front of amphibious assaults, 1941 to 1983



The first two of these parameters were designed to measure the breadth of front and dispersal of the landing force in amphibious operations. Dispersal is a key characteristic of OMFTS. Extended front assaults involve broader and deeper fronts without increasing the size of the assault force. The assault force is dispersed into self-contained formations or units, attacking at several points. For example, the U.S. Marines consider conducting extended front assaults with a single division—the same size assault force that would have landed on a one-mile front in World War II. Our two parameters needed to capture this dynamic. We needed to analyze not merely longer fronts but also the dispersal of the assault force.

The first parameter is the force-to-front ratio, intended as a rough measurement of the dispersal of amphibious assault forces (table 5). We computed this parameter by dividing the number of troops assigned to conduct the initial assault by the length of front. For example, 16,000 men landing on two beaches 100 miles apart would have a force-to-front ratio of 160. A high force-to-front ratio means

that forces are not dispersed but concentrated. A low force-to-front ratio means that forces are dispersed. In reality, forces are less dispersed than implied by this measure. An extended front assault usually involves multiple landings. At each landing point, assault units are concentrated. In the area between the landing points, there are usually no assault forces whatsoever. Accordingly, the force-to-front ratio needs to be interpreted with an understanding that it provides only a rough approximation of the dispersal of assault forces. The force-to-front ratio was used solely as a tool to identify cases for the case study analysis of extended front assaults. It was not compared to other quantitative data.

The second parameter is simply the length of the front of an amphibious assault, measured in miles. It was found by determining the horizontal distance between the furthest landing points in each operation. To better illustrate the dispersion of forces in table 5, we aggregated the data into two sets. Set One included battalion- to division-sized landings—the type of amphibious force that the United States could deploy based on its planned amphibious force structure. Set Two comprised multiple division-sized landings.

We compared the length of front to the remaining parameter: the percentage of total enemy forces opposing the initial assault. This comparison examines whether extended front assaults actually involved thin defenses, as the STOM concept paper postulates. The percentage of total enemy forces opposing the initial assault, measures the number of enemy forces in the area of the landing point (points) out of the total enemy forces operating in the theatre and available to counter an amphibious assault (table 6). For example, 80 Argentines opposed the British landings in the Falklands, but 9,500 were operating on the island and available to counter the landing. Hence the percentage of total enemy forces engaged in the initial assault was 1 percent. Total enemy forces do not include forces already engaging friendly non-amphibious units elsewhere in the theater. For example, the North Koreans fighting on the Pusan Perimeter are not included in the total enemy force for Inchon. A low percentage of total enemy forces engaged in the initial assault implies that defenses were thin: the enemy had not been able to concentrate

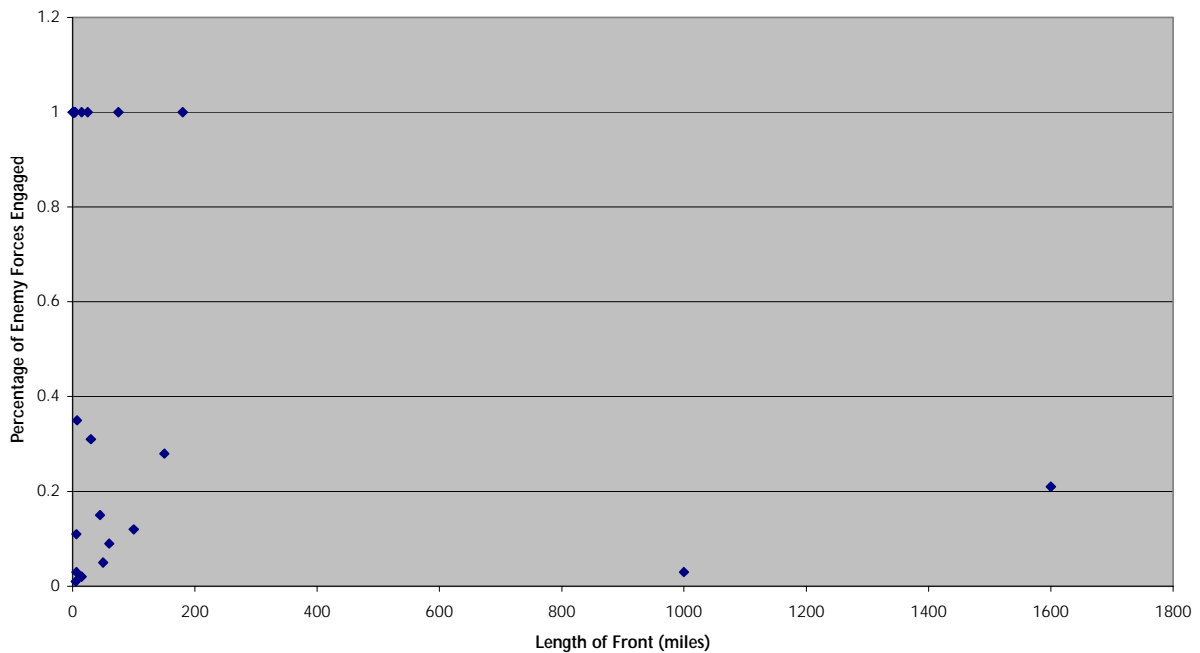
his forces to oppose the landing. A high percentage implies that defenses were thick: the enemy had been able to concentrate. We compared this parameter solely against the full set of length-of-front data in table 5.

Table 6. Percentage of total enemy forces opposing the initial landing

Operation	Total Enemy Force	Enemy Force Engaged	Percentage	Front (miles)
Crete	40,000	40,000	100%	75
Malaya	88,600	2,500	3%	1,000
Philippines	132,500	28,000	21%	1,600
Wake	500	500	100%	1
Timor	2,100	2,100	100%	180
Guadalcanal	3,600	3,600	100%	2
Sicily	350,000	43,400	12%	100
Salerno	50,600	15,600	31%	30
Tarawa	4,800	4,800	100%	1
Anzio	65,800	1,000	2%	15
Hollandia	65,000	18,000	28%	150
Normandy	750,000	70,000	9%	60
Tinian	9,000	9,000	100%	2
Saipan	32,000	32,000	100%	4
Guam	21,000	21,000	100%	15
Dragoon	230,000	34,000	15%	45
Peleliu	10,500	10,500	100%	1
Leyte	350,000	16,000	5%	50
Iwo Jima	21,000	21,000	100%	2
Okinawa	100,000	2,600	3%	6
Inchon	22,000	2,500	11%	6
Suez	17,000	6,000	35%	7
Starlite	1,500	1,500	100%	3
Deckhouse IV	1,000	1,000	100%	1
Badger Tooth	1,000	1,000	100%	1
Quang Tri City	1,000	1,000	100%	2
Falklands	12,200	80	1%	5
Grenada	1,300	1,300	100%	25

Figure 10 compares the length of front to the percentage of total enemy forces opposing the initial landing. A clear pattern cannot be discerned. However, in a number of cases, such as the Philippines, Malaya, and Sicily, assaults on very extended fronts engaged a low percentage of total enemy forces. Likewise, several assaults on very narrow fronts, such as Tarawa, Saipan, and Iwo Jima, engaged a high percentage of total enemy forces. Therefore, extending the assault front may have historically led to assault forces facing a less robust enemy defense at the landing points, as the STOM concept paper claims. However, this analysis does not verify the claim of the concept paper that extended front assaults induce the enemy to thin his front. It is not rigorous enough to do so.

Figure 10. Length of front vs. percentage of enemy forces engaged



Case study analysis

We identified two case studies that exemplify extended front assaults, and examined them to determine what factors have led to their success. Historically, there have been few examples of amphibious landings on fronts of 20 miles or more. Also, most have involved entire corps and are not relevant to current U.S. capabilities. Only six cases (see table 5) entailed relatively small formations: Crete, Malaya, the Philippines, Timor, Algeria, and Grenada. We examine the 1941–1942 Malayan Campaign and the 1983 invasion of Grenada. Both had low force-to-front ratios and involved less than two divisions in the initial assault.

The Malayan Campaign

The Malayan Campaign (1941–1942) exemplifies OMFTS. During the Malayan Campaign, 60,000 men of the Japanese Twenty-Fifth Army, commanded by General Yamashita Tomoyuki, invaded the Malayan Peninsula. The initial assault was along a front of approximately 1,000 miles. The main strength of the 5th Japanese Division landed at Patani and Singora in Thailand. Meanwhile, a brigade-sized force—the Takumi Detachment—from the 18th Japanese Division landed at Kota Bharu in Malaya, deep behind the British front line. The forces at Singora and Patani advanced rapidly on the Malayan frontier. After capturing the village and airfields of Kota Bharu, the Takumi Detachment formed a lodgment for the buildup of the 18th Japanese Division ashore. Near the end of the month, the division pressed forward toward the tip of the Malayan Peninsula. In the meantime, the 5th Japanese Division, joined by the Imperial Guards Division, sped down Malaya’s western coast. The campaign concluded on 15 February 1942 with the capture of Singapore and the surrender of 130,000 British, Indian, and Australian soldiers. It was the greatest defeat in British military history. By comparison, the Japanese lost only 9,800 men, albeit 16 percent of the Twenty-Fifth Army.

The extended front assault had a major positive effect for the Japanese campaign: it averted a narrow advance down the Malayan Peninsula. In other words, it increased the landing force’s scope for maneuver. The Japanese planning staff had decided to implement three simultaneous landings because the British had an airfield at Kota Bharu. The staff knew that if the airfield was not captured,

British aircraft could strike at the amphibious landings at Patani. In that situation, the Japanese would be constrained to a small beach-head, at Singora, with a single airfield. The landing force would be unable to win air superiority and effect a rapid offensive. Furthermore, the British possessed nearly twice as many men as the Japanese. A methodical frontal attack down the narrow Malayan Peninsula would have allowed the British to concentrate superior force and hold back the Japanese.

The extended front assault also had an important potential negative effect. The dispersed nature of the assault made the separate Japanese detachments vulnerable to high casualties and a slow advance if confronted by sizeable British forces. Accordingly, the Japanese needed to be prepared to overcome superior concentrations of British forces. Lieutenant Colonel Masanobu Tsuji, Twenty-Fifth Army Chief of Operations and Planning Staff, devised the invasion plan. Significantly, he wrote in his book, *Japan's Greatest Victory, Britain's Worst Defeat*: "My operations plan had to provide for defeating enemy resistance in positions which he chose to hold, and at the same time be flexible enough to deal with enemy counter-measures in such a manner as to leave no doubt of the issue."⁷¹

Nevertheless, Tsuji's plan was not based on exploiting British weak spots. Tsuji and the Twenty-Fifth Army planners intended to assault the British strong points on the Malayan border and at Kota Bharu without an overwhelming numerical superiority. The aim was to annihilate British strong points through superior infantry tactics.

Compounding the problem, the Twenty-Fifth Army possessed minimal intelligence of the area of operations. The best intelligence derived from a Japanese army officer who had traveled to Thailand prior to the attack and noted items of military interest. Most intelligence originated from British or Australian newspapers. The Japanese depended on outline maps for planning and navigation. Only a few reconnaissance flights were conducted before the landing.

71. Masanobu Tsuji, *Japan's Greatest Victory, Britain's Worst Defeat*, trans. Margaret Lake (Staplehurst: Spellmout, 1997), 27.

Because of the lack of intelligence, the Japanese underestimated the strength of the British forces.

In the event, the decision to assault the British strong point at Kota Bharu, albeit necessary, nearly spoiled the invasion. Although the 8th Indian Brigade was deployed across 30 miles of beach, the Takumi Detachment attacked the strongest concentration of British troops in the area. The beaches were fortified with barbed wire and concrete pillboxes. The Japanese lacked air supremacy and an overwhelming numerical superiority. Under the cover of naval gunfire, infantry landed during the small hours of 8 December. The Takumi Detachment encountered heavy resistance. British artillery sank several landing craft and the first wave suffered heavy losses.⁷²

Meanwhile, the Japanese surface vessels offshore faced British air strikes. The aircraft of the Royal Australian Air Force and Royal Air Force bombed the transport ships, disabling one, damaging two more, and interrupting ship-to-shore movement. Several commanders wanted to withdraw to sea temporarily. Japanese aircraft did not arrive to contest air supremacy until 0900 on 8 December. By the end of the landings, the Japanese had only two transport ships operational.⁷³

Ironically, the commander of the 8th Indian Brigade, Brigadier B. Key, did not realize the extent of damage inflicted on the Japanese and began a 30-mile withdrawal that night. In all, the Japanese suffered 850 casualties, of 5,300 total troops, in the Kota Bharu landing. The Indians and British had lost only 465 troops.⁷⁴

Regardless of the difficulties at Kota Bharu, the extended front assault was ultimately successful. Three attributes of the Malayan Campaign contributed to the Japanese success in mounting an extended front assault. First, the Japanese invasion caught the British

72. Alan Warren, *Singapore 1942: Britain's Greatest Defeat* (London: Humbledon and London, 2002), 60.

73. Tsuji, 29.

74. Warren, 62, 63.

command entirely off-guard. They had little indication of the impending attack. Bad weather had shielded the Japanese transports as they approached their landing beaches. Additionally, there was no prolonged preparatory air or naval bombardment. Night landings facilitated surprise. All of the Japanese forces commenced ship-to-shore movement in the small hours of 8 December.

Second, the British operational strategy was based on a forward defense. British forces were deployed along the border of Thailand and the eastern coastline. Over six months, they had built the fortified Jitra Line as the basis for their defensive. It was meant to delay a Japanese attack for three months. However, the line lacked depth and was weakly held. The British had also devised a plan for a spoiling attack, Operation Matador.

Third, and most importantly, the Japanese conducted aggressive combined arms tactics and outflanking movements, destroying the British forces piecemeal. The plan for the Malayan Campaign emphasized surprise and aggressive tactical action. Tsuji wrote:

There was...no other way for us to win except by rushing in immediately to attack Kedah Province by any means necessary as soon as we had made a landing, in order to seize the enemy airfields. At any sacrifice we had...to capture the enemy aerodromes at Kota Bharu and Alor Star, for use by our own Air Force.⁷⁵

Japanese forces acted with the boldness and independence required in the invasion plan. They faced resistance primarily at Kota Bharu and, to a lesser extent, Patani. From Patani and Singora the 5th Japanese Division pressed forward rapidly. Tsuji described the emphasis placed on seizing the initiative: "It was essential for us to break through the frontier without loss of time. As Staff Officer in Charge of Operations, I did not wait for orders but substituting for the Commander-in-Chief, in the interests of the whole Army I promptly speeded up the advance of every unit."⁷⁶ Elements of the 5th

75. Tsuji, 40.

76. Tsuji, 72.

Japanese Division, accompanied by tanks, advanced approximately 100 miles to the Malayan frontier in three days, preempting British counteroffensive movements. Thus, Japanese operational tempo was too great for Operation Matador to be effective.

Using infiltration tactics and outflanking movements, the Japanese dislocated the British defense and advanced quickly down the peninsula. Yamashita broke through the Jitra Line on the night of 11 December in an armored assault on the main road combined with a flanking movement to the east. The British fell back in disorder and tried to hold the Japanese along the main roads on the western coast of Malaya. The Japanese used repeated flanking movements through the jungle and rubber plantations to dislocate and dislodge the road-bound British and Indian forces. By the end of January, the Twenty-Fifth Army had reached the Straits of Johore across from Singapore.

The invasion of Grenada

The U.S. invasion of Grenada in 1983, Operation Urgent Fury, is another example of an extended front assault. Combined with the heavy use of heliborne and airborne landings, the broad front of the assault makes Urgent Fury a precursor of OMFTS. The invasion underlines some of the same strength and weaknesses of extended front assaults as the Malayan Campaign.

The major positive effect of extended front assault on Grenada was that it increased the landing force's scope for maneuver. Essentially, Urgent Fury enveloped the southern half of Grenada in a series of landings. The U.S. forces quickly seized important points on the island. Once enemy defenses had been penetrated, U.S. units could be repositioned to attack other enemy concentrations from unexpected directions.

Urgent Fury planned for two primary points of entry. Elements of the 22nd Marine Amphibious Unit would seize Pearl's Airport on the eastern side of the island. To the south, two battalions of Rangers, followed by four battalions of the 82nd Airborne Division, would assault Point Salines and capture the major airfield on the island.

The United States invaded Grenada in the early morning of 25 October 1983. The Rangers met tough resistance, described below, but eventually captured Salines Airfield. Two companies of the 22nd Marine Amphibious Unit landed via helicopter at Grenville and Pearls Harbour. They met minimal resistance and quickly captured Pearl's Airport. The extended front assault had enabled the U.S. forces to capture key points quickly and then move forward toward eliminating resistance on the rest of the island. In particular, Marine units were repositioned to relieve a special mission force trapped at the Governor's Mansion and capture the strong point of St. George's, converging with the airborne units. Two companies from the 22nd MAU landed at Grand Mal Bay on the western side of the island on the night of 25 October. The first company arrived first via landing craft and AAV at 1900, 25 October. A tactical pause occurred at the beach for several hours because the commanding officer had lost communications with headquarters. Additionally, the second company, redeployed by helicopter from Grenville, did not arrive until 0400, 26 October. Nevertheless, the Marines ultimately moved forward and advanced to the Governor's Mansion and St. George's against scattered resistance. Thereafter, the Marines, Rangers, and 82nd Airborne captured St. George's and cleared the island relatively quickly. In all the United States suffered only 100 casualties in the invasion.⁷⁷

As in the Malayan Campaign, the major drawback of extended front operations was that dispersed amphibious ground units were vulnerable to denser concentrations of enemy forces.

Grenada was not well defended. Approximately 1,200 of the defending forces were regular Grenadian army (PRA). Additionally, 40 Cuban military advisors and 650 armed Cuban construction workers were on the island, building the Point Salines airfield. Several anti-aircraft guns were in place that could threaten helicopter operations.⁷⁸ News of an imminent assault had leaked as Operation Urgent Fury was being planned. Unfortunately for the Rangers, the Grenadians and Cubans expected the operation to target Point Salines and

77. Ronald Spector, *U.S. Marines in Grenada, 1983* (Washington, DC: Headquarters, U.S. Marine Corps, 1987), 14–16.

the airfield. They concentrated their forces, including the few mechanized vehicles in Grenada's inventory, on a forward defense of this area.⁷⁹

U.S. intelligence prior to the invasion was poor. Troops depended on tourist maps to navigate the terrain and plan tactical movements. Furthermore, there was almost no information on enemy defenses and tactical dispositions. Consequently, the Rangers inadvertently dropped on the enemy concentration at Point Salines, slowing the advance and multiplying casualties. Heavy anti-aircraft fire engaged aircraft and helicopters. On the ground, the Cubans put up a stiff fight. The PRA even launched three counterattacks against the Rangers. Nevertheless, the Rangers eventually secured the airport and the nearby medical school where some American students were supposedly being held hostage. The U.S. forces then advanced cautiously through the southern half of the island.⁸⁰

The main attribute of the extended front assault that contributed to its success was the emphasis on combining aggressive action with the quantitative superiority of U.S. manpower and firepower. Due to a lack of intelligence, U.S. commanders planned a sudden attack in overwhelming force. Strategic points, such as the airfields and key command and control assets, would be seized swiftly and American hostages spirited from Grenada.⁸¹

Over 8,000 U.S. troops eventually landed on the island, opposed by only 1,300 Grenadian and Cuban regular soldiers. Sea Cobra attack helicopters and AC-130 gunships provided robust air support to the infantry on the ground. The Marine seaborne landing at Grand Mal Bay included five tanks. Once the Rangers captured the Salines

78. Michael Evans, *Amphibious Operations: The Projection of Sea Power Ashore* (London: Brassey's, 1990), 118.

79. Mark Adkin, *Urgent Fury: The Battle for Grenada* (Lexington: Lexington Books, 1989), 164.

80. Adkin, 140-146.

81. Ronald Cole, "Grenada, Panama, and Haiti: Joint Operational Reform," *Joint Forces Quarterly*, no. 20 (Autumn/Winter 1998-1999), 58.

Airfield, elements of the 82nd Airborne Division flew in, adding men and heavy weapons to the assault. The final attack on St. George's received backing from the Marine armor and close air support from U.S. Navy tactical aircraft. The Cubans and Grenadians could not resist such a comprehensive and overwhelming assault. Their numbers were too few to cover every landing site, and they lacked the heavy weapons to defend even a small area such as Point Salines.

Summary for extended front assaults

The historical effects of extending the assault front are slightly different from the expected effects cited in the OMFTS and STOM concept papers. To reiterate, the two expected effects are that extended front assaults would encourage self-contained formations to advance rapidly on multiple axes and induce the enemy to thin his forces.

We found little historical evidence of self-contained formations rapidly penetrating enemy defenses at *all* points of entry and converging forthwith on the operational objective. Some landings in Grenada and Malaya witnessed success and a high operational tempo in this regard, but others stalled against enemy resistance. Even when operating on a broad front, amphibious assault forces have historically executed frontal attacks supported by flanking maneuvers rather than operate as self-contained combined-arms teams from the line of departure through assigned inland objectives, as postulated in the STOM concept paper.

On the other hand, the overall weight of evidence suggests that attackers faced thin defenses when conducting an assault along a more extended front. Although the Cubans and Grenadians actually concentrated against the likely landing spot, the British foolishly thinned their forces in Malaya. Additionally, the quantitative data shows some relationship may exist between longer fronts and thin enemy defenses. Further statistical analysis combined with more intensive data collection could provide stronger conclusions.

We also found two operational benefits of extended front assaults. First, in the case studies, extended front assaults provided opportunities to outflank or attack an opponent from an unexpected direction.

If successful, multiple landings over a broad front limited the opponent's ability to channel an attack. For example, the Japanese amphibious assault on Malaya averted a single advance down the narrow Malayan Peninsula. And the breadth of the U.S. assault on Grenada enabled new landings to be conducted when the Rangers were stalled in Point Salines.

Second, extended front assaults may entail low casualty rates. U.S. forces in Grenada suffered a very low casualty rate. In Malaya, the Japanese suffered a moderate casualty rate of approximately 16 percent. However, an important caveat needs to be added to this conclusion. The Germans suffered 30 percent losses in their extended front assault on Crete (a front of 75 miles). Given the few historical cases of extended front assaults, this relatively high casualty rate is noteworthy.

Moreover, in the case studies, we found a negative effect of extended front assaults. Dispersed assault units were stalled by enemy strong points and were vulnerable to enemy counterattacks. The greater the dispersal, the less organic combat power available to cope with an intense combat environment, and hence a greater reliance on fire support from sea-based and air assets. The resistance encountered at Point Salines and Kota Bharu demonstrate how strong points could stall and inflict losses on dispersed forces.

The riskiness of dispersal is underlined by historical evidence. Although not amphibious operations, in the North African Campaign and Chindit Expeditions the British deployed self-contained brigade- and battalion-sized formations/units. Heavy losses often rendered them operationally ineffective. Operating beyond mutual support, they lacked the organic combat power to repeatedly battle concentrated German or Japanese divisions. A fuller study of these purely ground campaigns would probably aid in forecasting the effects of dispersal for OMFTS.

We identified four attributes of the Malayan Campaign and the invasion of Grenada that contributed to success. First, in both cases, the defender implemented a forward defense. This defensive doctrine called for a thin depth and could easily be penetrated and outflanked. Second, aggressive tactics were a key factor in seizing the

initiative. In Malaya, they enabled the Japanese to dislocate the British and Indian defenses at strong points such as Kota Bharu and the Jitra Line. Essentially, the assault forces needed to execute flanking movements and seize the initiative in order to overwhelm enemy defenses. Third, surprise was important to extended front assaults. Because the Japanese emphasized surprise, they caught the British entirely off-guard and unprepared in Malaya. Fourth, in the invasion of Grenada, the U.S. forces had overwhelming numerical and fire-power superiority and sufficient forces to conduct several landings without being overextended. Against such strength, the Grenadian and Cuban resistance was guaranteed to be short lived.

Conclusion

This report encompasses two pieces of analysis: first, a historical assessment of key changes in amphibious warfare meant to test the expected utility of OMFTS; and, second, a quantitative and case study analysis meant to identify historical approaches for implementing OMFTS. The conclusion of the report combines the two pieces of analysis to provide a general assessment of the relationship between OMFTS and historical reality.

Our historical findings versus OMFTS/STOM concept papers

Our results confirm some claims of the OMFTS and STOM concept paper yet challenge others. In general, the concept papers do not address several important historical points.

“Chaos in the littorals”

There is a gap between the expected utility of OMFTS and the historical utility of amphibious warfare. The concept papers claim that OMFTS will have a broad utility in many types of conflicts. It will supposedly be able to counter a current trend of “chaos in the littorals.” To the contrary, the historical assessment shows that amphibious warfare has not been applicable to all conflicts—specifically not to those involving unconventional warfare or entailing a potential for unwanted escalation.

Increased decisiveness

Our historical assessment largely agrees with the assumption behind OMFTS that amphibious warfare has the potential for greater decisiveness. Information technology, and new command and control systems, may allow commanders to better target enemy weak spots and control forces. Some historical evidence already exists from battles in

Vietnam, the Falklands, and Afghanistan that precision-guided munitions afford ground forces new levels of firepower support and enable them to operate in a more dispersed manner. Most importantly, heliborne landings provide a capability to envelop or outmaneuver enemy forces.

Operational pause

The OMFTS concept paper emphasizes the slow buildup of supplies ashore as the major cause of operational pause. The quantitative comparisons and case studies refine this claim. Historically, the supply buildup ashore has been important but enemy resistance has been at least equally so. Most amphibious assaults have not progressed into a breakout stage until enemy resistance has been overcome.

Extended front assaults

The OMFTS and STOM concept papers claim that assaults on broad and deep fronts will enable the attacker to cut through opposing defenses with self-contained formations operating on multiple axes of advance. Faced with numerous possible points of attack, the defender will be compelled to thin his forces. We found little evidence to substantiate the idea that extended front assaults will enable the self-contained formations to penetrate a defensive system without fighting major engagements that will slow operational tempo. On the other hand, extended front assaults often faced relatively thin defenses. Extended front assaults will probably present the attacker with more gaps to exploit.

We found three additional effects of extended front assaults, not well noted in the concept papers. First, although extended front assaults do not enable the attacker to cut through enemy defenses, they did provide opportunities to attack the defender from unexpected directions. The scope for maneuver increased. Second, extended front assaults may have an additional positive effect of lowering casualty rates. This particular result requires further investigation, given the small number of historical cases of extended front assaults. Third, the concept papers neglect the major negative effect of extended front assaults: dispersing forces in multiple landings increases each assault unit's vulnerability to enemy counteraction and to the delay caused

by enemy strong points. Historically, having sufficient mobility to execute repeated flanking maneuvers has helped to overcome this challenge.

Sea basing

The OMFTS concept paper emphasizes sea basing as fundamental to the successful implementation of the concept. Sea basing will supposedly remove the need to place supplies ashore. Our analysis confirms sea basing to be a component of attaining OMFTS. Amphibious assaults exemplifying OMFTS have met logistical demands through either assaulting a port or supplying ground forces directly from the amphibious fleet, i.e., sea basing. In fact, sea basing was implemented in Operation Starlite. Furthermore, the British unsuccessfully attempted to supply their forces through sea basing, in the Falklands War. Historically, the alternative to sea basing or seizing a port has been to press ground forces forward regardless of the supply situation. For example, the Japanese forces landing in Thailand during the Malayan Campaign advanced relentlessly, disregarding the supply situation. This approach is very risky. The attacking ground force can easily become overextended and in a tenuous forward position with no supplies or ammunition.

The six tenets of OMFTS

In addition to sea basing, our historical assessment found that certain means of overcoming enemy resistance have been essential to success in amphibious operations resembling OMFTS. The OMFTS concept paper postulates six essential tenets for the concept's successful implementation (listed in the introduction of this report). Our historical assessment highlights four of the characteristics as integral to overcoming enemy resistance at the beachhead and conducting extended front assaults.

Tactical actions should generate overwhelming tempo and momentum

Historically, aggressive combined arms tactics in conjunction with tactical maneuver have been fundamental to overcoming operational pause and ensuring effective extended front assaults. Bold tactical

action has seized the initiative and enabled the attacker to destroy the defending forces piecemeal before they could concentrate for a counterattack. Infantry has infiltrated through enemy defenses, and armor has provided the shock power and mobility necessary to defeat enemy resistance.

Assaults pit the attacker's strength against the defender's weakness

By exploiting enemy weak spots, assaulting forces have been able to penetrate and dislocate his defensive system. Attacking a strong point has led to higher casualties and greater delays in operational tempo.

Emphasis is placed on intelligence, deception, and flexibility

Good intelligence has contributed to success, particularly in appraising enemy strength and locating weak spots, exemplified by the Inchon operation. More notably, the lack of intelligence has caused landing forces to face unexpected obstacles, as in the Malayan Campaign, the invasion of Grenada, and the Battle of Tarawa.

Integrates all organic, joint, and combined assets

OMFTS refers to the importance of firepower but does not sufficiently emphasize its fundamental importance in amphibious assaults. Throughout the Cold War, relatively small French, British, South Vietnamese, and American formations and units successfully conducted amphibious assaults. In most cases, these formations and units received strong support from air power or naval gunfire. Air power and naval gunfire substituted for the limited amount of organic firepower available in an amphibious assault. Greater firepower suppressed the enemy and impeded a coherent defense. In certain cases, small units were able to engage in a high-intensity combat environment because long-range fire support inhibited enemy counterattacks.

An additional tenet

Our historical assessment found one additional tenet, not noted in the concept papers, that is essential to overcoming enemy resistance and conducting extended front assaults.

Operations are adapted to counter the enemy's operational doctrine

Historically, the operational doctrine chosen by the enemy has had a large impact on the effectiveness of an assault. It has affected potential casualties, operational tempo, and even the probability of an engagement. For example, a forward defense has often involved a thin crust of defenders that an extended front assault could crack. However, a guerrilla defense has usually evaded the amphibious assault, lowering the expected utility of any such operation. The enemy's defensive doctrine is not a factor that the amphibious commander controls. Rather, it must be dealt with as a potential obstacle in any operation. OMFTS must be able to adapt to different defensive methods. No set operational method, such as multiple formations attacking over a broad front, will be universally effective. Significantly, amphibious warfare in the Vietnam War was ineffective because it failed to adapt to the Viet Cong and North Vietnamese operational doctrine of guerrilla warfare.

General recommendation

In general, OMFTS is a laudable concept that moves past the slow operational tempo and high casualty rates of World War II amphibious operations. It takes advantage of recent technological advances that raise the potential decisiveness of amphibious operations. Logistics is given proper emphasis as central to improving operational effectiveness. Furthermore, OMFTS grasps several key attributes of successful amphibious warfare, such as targeting enemy weak spots and maintaining a high operational tempo. However, the concept is not fully developed. The concept papers narrowly focus on the positive effects of building a sea base, and do not sufficiently consider how dispersed operations will overcome enemy resistance. OMFTS is also over-generalized as a universally useful method of warfare. Historical strategic and operational constraints on amphibious warfare are neglected.

Therefore, OMFTS needs to be expanded into a more realistic and pragmatic concept. Strategic and operational constraints, such as the risk of escalation and unconventional warfare, need to be accounted for. The resulting doctrine needs to address overcoming enemy

resistance in an intense combat environment risky for dispersed units. Most importantly, the broad concept of multiple formations maneuvering on huge fronts without pause to the operational objective needs to be developed into a focused concept designed to cope with the both the high probability of intense combat and the logistical dilemmas that exist.

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