

Precarity in the Pacific:
An Examination of the Application of American
Airpower in a Sino-U.S. Conflict

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The following is a potential scenario for how a Sino-U.S. conflict may commence.

0500, 15FEB2020 - 21 miles northwest of Mischief Reef, Spratly Islands

Officers standing watch in the Combat Information Center (CIC) aboard the USS *Carl Vinson* receive a radio transmission with urgent intelligence information from an E-2 *Hawkeye* patrolling the carrier's airspace as part of Carrier Strike Group 1's (CSG1) air wing. During the patrol, the early-warning air platform detected activity around three weapons systems on a nearby island, Mischief Reef. CSG1 has been conducting 'freedom of navigation' exercises and keeping a close eye on the disputed island where the Chinese have added landfill and an airstrip, and built up military capabilities (BBC 2017). The aircraft relays the surveillance images back to the carrier. The Commanding Officer (CO) of the USS *Carl Vinson*, the Commander of CSG1 (CCSG1), the Commander of U.S. Pacific Fleet (COMPACFLT), and the U.S. Pacific Combatant Command (USPACOM) Chain of Command are notified.

0535, 15FEB2020 - 21 miles northwest of Mischief Reef, Spratly Islands

CSG1's intelligence officers examine the E-2 *Hawkeye*'s images. Upon closer inspection, the systems are identified as Dong-Feng 21 anti-ship cruise missiles, more commonly known as "carrier-killers" (Kazianis 2017). Further intelligence is relayed by the E-2 *Hawkeye* and other airborne aircraft of the heat signatures of the weapons systems and intercepted Chinese radio transmissions on the island (U.S. Navy 2009). The intelligence officers conclude that the weapons systems have been turned on and are in the process of being loaded. CCSG1 alerts the Strike Warfare Commander (SWC), who is in charge of CSG1's air wing, the Air Warfare Commander (AWC), who is responsible for CSG1's air defenses, and the Surface Warfare Commander (SUWC), who oversees the coordination of sea-based warfare (United States Naval Reserve Intelligence Program). The U.S. Air Force's 18th Wing, stationed out of Kadena Air Base, Okinawa, is notified (U.S. Air Force). The Wing has been operating jointly with the U.S. Navy's Pacific fleet to monitor and deter the Chinese threat (Air-Sea Battle Office 2013, 7).

0610, 15FEB2020 - 17 miles northwest of Mischief Reef, Spratly Islands

CCSG1 orders the launch several of the air wing's EA-6B *Prowlers* and F/A-18 *Hornets* (U.S. Navy). These aircraft, and the 18th Wing aircraft currently in the area, are told to fly closer to Mischief Reef to collect further intelligence and maintain visual contact, as well as set up a screen around the carrier. To the officers in command, the activity around the weapons systems seems different from past Chinese military posturing in the South China Sea. CCSG1 receives an order from their Chain of Command: *Do not launch a preemptive strike on Mischief Reef. Only strike if attacked.*

0623, 15FEB2020 - 14 miles northwest of Mischief Reef, Spratly Islands

The officers in the CIC aboard the USS *Carl Vinson* and the CSG's four other ships detect 21 incoming threats. The Chain of Command is notified.

0624, 15FEB2020 - 14 miles northwest of Mischief Reef, Spratly Islands

The threats are confirmed as Dong-Feng 21 anti-ship cruise missiles. They are on a trajectory towards the carrier. The AEGIS Ballistic Missile Defense Systems aboard CSG1's three destroyers

and one cruiser are activated (Lockheed Martin). The remaining strike fighters and helicopters of the carrier's air wing are launched. CCSG1 orders defensive measures to commence.

0626, 15FEB2020 - 14 miles northwest of Mischief Reef, Spratly Islands

The ships in CSG1 launch their SM-3 interceptors, effectively striking 13 of the incoming missiles (Raytheon). The airborne USN and USAF strike aircraft intercept the 8 remaining threats using their onboard weapons capabilities. Defensive measures against this attack have been a success.

0634, 15FEB2020 - 14 miles northwest of Mischief Reef, Spratly Islands

The officers in the CIC aboard the ships of CSG1 detect 39 incoming threats from Fiery Cross Reef and Subi Reef, two Chinese-controlled reclaimed islands to the west and northwest, respectively, of Mischief Reef (Asia Maritime Transparency Initiative 2016; Asia Maritime Transparency Initiative 2017). 18th Wing, the CO of the USS *Carl Vinson*, and CCSG1 receive an order through their joint Chain of Command: *An attack on a U.S. Naval vessel is an attack on the United States. Strike all Chinese-controlled land and weapons systems in the Spratly Islands. War has commenced.*

Introduction

The potential for conflict between China and the United States is not a new phenomenon. As prominent actors in the Western Pacific Theater of Operation (WPTO), the two nations have had opposing interests in the region throughout the past half-century. In 1950, a Sino-U.S. conflict manifested itself in an ideologically driven proxy war on the Korean Peninsula (Hickey 2011). Although a direct war did not break out between the People's Republic of China (PRC) and the United States (or the USSR and the United States), both countries attempted to establish and sustain a regional order that aligned with their respective national objectives. According to Robert Farley, as a result of "the memory of Chinese intervention [in the Korean War], but also in combination with China's domestic politics, the United States managed to keep the PRC isolated from the international system into the 1970s" (2017). Specifically, the United States strengthened its ties with Pacific allies, maintained strong military power projection throughout the WPTO, and demonstrated commitment to America's

international objectives (Van Tol et al. 2010, ix). These efforts discouraged China from pursuing aggressive, expansionary goals, since attempting to counter the United States' superiority would have had severe political and economic implications (Kagan 2017). In turn, America's global presence, in comparison to that of China in the latter half of the 20th century, effectively deterred the outbreak of a second Sino-U.S. conflict.

Over the past two decades, tensions between the two nations have heightened and this stability has begun to falter. The United States continues to maintain its military presence in the region. However, the nation now faces a lack of strong political and popular support for military involvement abroad, rising costs for countering China's advanced Anti-Access/Area Denial (A2/AD) capabilities, and wavering commitment to its Pacific allies (Gompert et al. 2016, ix; Van Tol et al. 2010, ix; Kagan 2017). These factors make the United States' power projection, particularly in the WPTO, an increasingly challenging undertaking. A reciprocal shift in capability and commitment has occurred in China: as the nation has grown to become an economic and political power, its frustration with the global order, as imposed by the U.S. and its democratic allies, has increased (Kagan 2017). In turn, China views the United States' global presence, specifically in the Pacific, as the greatest obstacle to Chinese hegemonic goals (Mingfu 2010). According to Robert Kagan, China believes that, if it can force the United States to withdraw its influence from the WPTO, it will be able to dominate America's Pacific allies and force them to conform to Chinese "strategic, economic, and political preferences" (2017). As a result, China has devoted its efforts to advancing its military capabilities and expanding its regional influence so that it can replace the United States as the dominant power in the Pacific.

These shifts in the Sino-U.S. balance boil down to a fundamental tension: China's goal is

to continuously expand its political, economic, and military presence in the Pacific, whereas the United States' goals are to contain Chinese expansion and minimize the degree to which China infringes on U.S. and allied interests. As each nation continues to flex its military muscles, tensions will rise, and the likelihood of conflict will increase. According to Jan Van Tol et al., without adequate preparation, "the United States will find itself effectively locked out of a region that has been declared a vital security interest by every administration in the last sixty years" (2010, ix). Therefore, it is of vital importance that we analyze this potential conflict and how the United States will respond.

In this essay, I will assess the role that American airpower in particular will play in a future Sino-U.S. conflict, and will argue that airpower's advantages significantly outweigh its disadvantages in this context. To conduct this analysis, I will first lay the groundwork for subsequent sections by making several assumptions about the character of the conflict and the role of airpower. Then, I will identify three of the conflict's defining characteristics: unpredictability, geographic scale, and complexity. I have selected these three because they are central to academic, political, and military conversations about this Sino-U.S. scenario, and will play a key role in determining how the actors are able to mobilize and engage. Moreover, these characteristics highlight the conflict's unique intricacy, wherein the identities and capabilities of the actors make this conflict quite different from others in recent decades. Following an examination of each of these components, I will consider the corresponding advantages of airpower and will provide historical examples to support my analysis. Specifically, these advantages are its versatility, effective range, and precision. This paired structure of characteristics and advantages permits a focused investigation of the conflict. In the following

section, I will identify and address several counterarguments to my analysis regarding the disadvantages of airpower. I will contend that, although there are sizable limitations to the applicability of airpower, they can be mitigated and do not outweigh its significant advantages in this context. In turn, this analysis will support my assertion that airpower will serve as a key asset for the United States throughout a military engagement with China. I will conclude this essay with policy recommendations, as well as several key takeaways about the application of airpower in future conflicts.

This essay is not an operational analysis, as my objective is neither to critique U.S. doctrine nor to make arguments about how military leaders should implement specific air platforms at the tactical and operational levels. Rather, the purpose of my investigation is to inform a strategic-level conversation about how the United States can apply airpower to fight this conflict most effectively. It is only through a critical analysis of planned applications of military force that the United States will be prepared to counter the unique, emerging threats to America's historical military superiority in the WPTO.

Assumptions

As technology progresses, conflicts become increasingly complex, both in terms of their breath and depth. Whereas wars were historically fought on land and sea, wars in the 20th and 21st centuries have been waged across an ever-increasing number of domains. In the case of a Sino-U.S. conflict, a variety of political, economic, and military factors will influence how it commences and progresses (Dobbins et al. 2017, 11). Additionally, it will likely span numerous warfare domains, including land, sea, air, space, and cyberspace (Gompert et al. 2016, iii). Each of these components carries with it an exhaustive list of considerations. However, addressing

them all at once is not feasible, given the scope of this essay. Therefore, in order to conduct a focused and productive analysis of this potential Sino-U.S. case, particularly in terms of the use of airpower, my foundational assumptions are that it will be conventional and non-nuclear, and that airpower will play a central role.

The conflict will be conventional due to the identities of the actors and likelihood of limited warfare. "Conventional warfare" is an open engagement fought by two or more states, each using non-nuclear weapons to attack their adversary's military systems and forces for the purpose of disabling their offensive and defensive capabilities (Piddock 2009, 2). A Sino-U.S. conflict fits this category because the actors are states rather than unconventional forces, such as insurgents or terrorists. Moreover, China and the United States possess relatively comparable military capabilities, making this engagement more symmetric than it would be if unconventional actors were involved. In turn, this analysis will assume that a Sino-U.S. conflict will be conventional because the actors will not escalate to nuclear warfare. As Gompert et al. explain, "even in an intensely violent conventional conflict, neither side would regard its losses as so serious, its prospects so dire, or the stakes so vital that it would run the risk of devastating nuclear retaliation by using nuclear weapons first" (2016, 11). Since both nations possess strong nuclear capabilities, nuclear escalation would guarantee the devastation of both actors, which therefore prevents their use. Instead, each side will employ conventional "military offensives to eliminate the enemy", thereby restricting themselves to limited warfare (Malone 2015, 1). Based on these assumptions about the conventional and non-nuclear nature of this conflict, an analysis of airpower is now feasible.

In this essay, "airpower" is defined as "the ability to project military power or influence

through the control and exploitation of air, space, and cyberspace to achieve strategic, operational, or tactical objectives” (Air University 2015, 1). Additionally, I have chosen to use “conflict”, rather than “war”, because “conflict” describes a physical engagement between combatants, which I predict will occur, whereas a war may or may not involve fighting between military forces. This is not to say that this engagement won’t evolve into a war with economic and political warfare occurring in conjunction with the conflict. I am merely asserting that this Sino-U.S. case will involve a significant amount of combat between both nations’ militaries.

We can assume that airpower will play a large role because it is a central component of the military frameworks that the United States Department of Defense has developed for the 21st century. Of these frameworks, one of the most important is the AirSea Battle operational concept, which was created “to address the anti-access/area denial (A2/AD) military problem set” that the United States currently faces and can expect to face in the coming decades (Air-Sea Battle Office 2013, 1). According to Van Tol et al., a central purpose of AirSea Battle is “to sustain a stable, favorable conventional military balance throughout the Western Pacific region” by “maintaining an ability to deter China from acts of aggression or coercion in that region and, if necessary, to respond effectively in the event deterrence fails” (2010, 10). In preparing for the rising Chinese threat, the concept necessitates that the U.S. Navy (USN) and U.S. Air Force (USAF) operate jointly so that the United States can successfully counterbalance and fight China in all warfare domains (Air-Sea Battle Office 2013, 4). Specifically, AirSea Battle experts predict that airpower will carry much of the responsibility for “executing a blinding campaign against PLA battle networks”, “executing a suppression campaign against PLA long-range ISR and strike systems”, and “seizing and sustaining the initiative in the air, sea, space

and cyber domains” (Van Tol et al. 2010, xiii).¹ In turn, based on airpower’s central role in the United States military’s plans and projections for engagements in the WPTO, it is both feasible and necessary to study its application for a Sino-U.S. conflict.

I will now examine three central characteristics of this conflict, and the corresponding advantages of airpower in addressing them.

Characteristic #1: Unpredictability

A Sino-U.S. conflict will contain a certain degree of unpredictability from its onset. Perhaps most important is the number of ways in which it may start. Causes may include, but are not limited to, a Chinese invasion of Taiwan, military aggression in the South China Sea or East China Sea, Chinese hostility towards Japan and South Korea, or, intervention on the Korean Peninsula (Gompert et al. 2016, 8) [see Appendix A for a discussion about potential causes of the conflict]. In each scenario, we can expect China to be the initiator. The reason for this is twofold. First and foremost, the United States has historically been the superior military force in the region. According to David Gompert et al., this asymmetry has led Chinese leaders to believe that, as the emerging regional power, the most surefire way to overcome America’s historical advantage is by “taking the initiative, making sudden gains, [and] degrading U.S. strike forces” (2016, 13). This approach is clearly articulated in “China’s Military Strategy”, published by The State Council Information Office of the People's Republic of China, which asserts that “the armed forces will pay close attention to the challenges in new security domains, and work hard to seize the strategic initiative in military competition” (2015). Thus, China is focused on initiating the conflict in order to gain a strategic advantage.

¹ These applications of airpower will be covered more extensively later in this essay.

The United States, on the other hand, is much less likely to act first. Our military's main priority in the WPTO is to offset China, not to immediately initiate a conflict with this adversary (Air-Sea Battle Office 2013, i). A central reason for this is that the U.S. faces, and will continue to face, a wide range of global threats. In turn, our military leaders are not interested in initiating a conflict with any specific one (Air-Sea Battle Office 2013, 2). However, this does not mean that the United States will avoid conflict at all costs. Rather, according to Van Tol et al., the United States' emphasis on counter-balancing China's growing power necessitates that our military is able "to respond effectively in the event deterrence fails" (2010, 10). Even though the United States will not initiate the conflict, there will be a point at which the military must act in order to defend the United States' assets and interests in the WPTO. As Robert Farley explains, "the United States will almost certainly require some clear, public signal of Chinese intent to escalate to high-intensity, conventional military combat before it can begin engaging Chinese forces" (2017). Therefore, if and when China mobilizes its forces in an attempt to seize the initiative, the United States will respond decisively. However, as in all conflicts, a certain degree of unpredictability will likely remain.

Advantage #1: Versatility

In the face of this unpredictability, one large advantage of airpower is its versatility, which enables the U.S. military to rapidly respond to a number of threats. According to the British Ministry of Defense, "the multi-role capability of many platforms... permits air assets to move quickly and decisively between the strategic, operational and tactical levels of warfare, and to move across and between operational theaters – sometimes during the same mission" (2009, 17). The United States possesses a diverse set of aircraft and aerial weapons systems

that exemplify this versatility. Specifically, the USAF currently operates over 30 platforms, ranging from radar management aircraft and utility helicopters, to low-altitude close air support aircraft and long-range bombers (U.S. Air Force). Additionally, the USN operates five carrier-based platforms and three land-based platforms, which include helicopters, electronic warfare aircraft, fighters, and intelligence, surveillance, and reconnaissance (ISR) platforms (U.S. Navy 2017). When paired with various weapons systems, such as bombs, missiles, and torpedoes, these air assets have a diverse array of capabilities that can be scaled and modified to address specific threats. For example, a single platform, such as the USN's P-8A *Poseidon*, is capable of "anti-submarine warfare, anti-surface warfare, shipping interdiction, and electronic signals intelligence", and "can also deploy and monitor sonobuoys" (U.S. Navy 2017). When used alongside the F/A-18E/F *Super Hornet* and EA-18G *Growler*, as well as USAF aircraft, these platforms can effectively monitor an enemy, jam their communications and weapons systems, and strike specific targets. Put simply, airpower's versatility enables the United States to neutralize threats across numerous warfare domains and mitigate the unpredictability of the conflict.

A historical air campaign that demonstrates this advantage of airpower is Operation Desert Storm (1991) of the First Gulf War (1990-1991). During this conflict, the United States relied heavily on airpower to eliminate a number of threats including Iraqi air defenses, military forces, and Scud missiles, as well as communications systems, infrastructure, and leadership (Mann 1995, ix). For example, the A-10 *Thunderbolt* was used primarily in its close air support capacity, as well as for preventative strikes and air-to-air combat, while the F-111 *Aardvark* carried out both long-range interdiction and precision attacks on mobile military forces (Air

Force Doctrine Document 1 1997, 23-24). Numerous other platforms demonstrated equal versatility and effectively eliminated a sizable amount of Iraqi air, land, and naval assets, as well as the nation's broader military infrastructure and many of its weapons systems. As explained in Air Force Doctrine Document 1, "the versatility and responsiveness of airpower allows the simultaneous application of mass and maneuver", and, in the case of Operation Desert Storm, the air campaign was effectively conducted against "a broad spectrum of targets... with sufficient force to overwhelm the enemy" (1997, 17, 24). Airpower played an important role in the First Gulf War, as it contributed greatly to the joint coalition force's ability to effectively disable the Iraqi Army and end the invasion of Kuwait.

Airpower's versatility will have an equally important impact in a Sino-U.S. conflict. Consider the scenario of a Chinese invasion of Taiwan. For decades, China has opposed Taiwanese independence and has repeatedly threatened to "retake" the island nation, which it views as "a breakaway province", by force (BBC 2016). Though this potential conflict is not new, it has become increasingly urgent: as China further develops its military capabilities, it is more likely that it will attempt to violate Taiwanese sovereignty in an effort to demonstrate what it believes to be its regional authority (Gompert et al. 2016, 8; Office of the Secretary of Defense 2017, 6). In the case of Chinese aggression, the United States will need to act quickly to prevent a full-scale invasion. China has built up more than 25 airbases within airstrike range of Taiwan, as well as numerous other stationary and mobile ballistic missile systems further inland, meaning that a PLA invasion by land and air would occur rapidly (Van Tol et al. 2010, 11). The United States will depend on airpower's versatility to address these threats. First, electronic warfare aircraft can intercept and jam Chinese communications systems, and fighters can be

launched from the Philippines, Okinawa, and nearby aircraft carriers to engage PLA aircraft. Subsequently, medium- and long-range bombers can be sent to strike Chinese weapons systems, command and control centers, and ground forces (Pape 1996). According to the British Ministry of Defense, “aircraft can be redirected to respond to sudden changes in circumstances, on widely dispersed fronts, to synchronize firepower and complement the manoeuvre of surface forces” (2009, 1.2.7). As the conflict develops, so too will the roles of these platforms. For example, in addition to engaging enemy aircraft, fighters may provide close air support to Taiwanese forces. Additionally, while jamming Chinese signals, electronic warfare aircraft may work jointly with surveillance aircraft to provide communications support over Taiwan and monitor incoming PLA attacks. Though it is difficult to predict how each platform will be utilized in a given scenario, the diversity of air platform capabilities will contribute enormously to the United States’ ability to effectively respond as the conflict develops. Therefore, in the face of uncertainty, airpower’s versatility will prove to be an acute advantage.

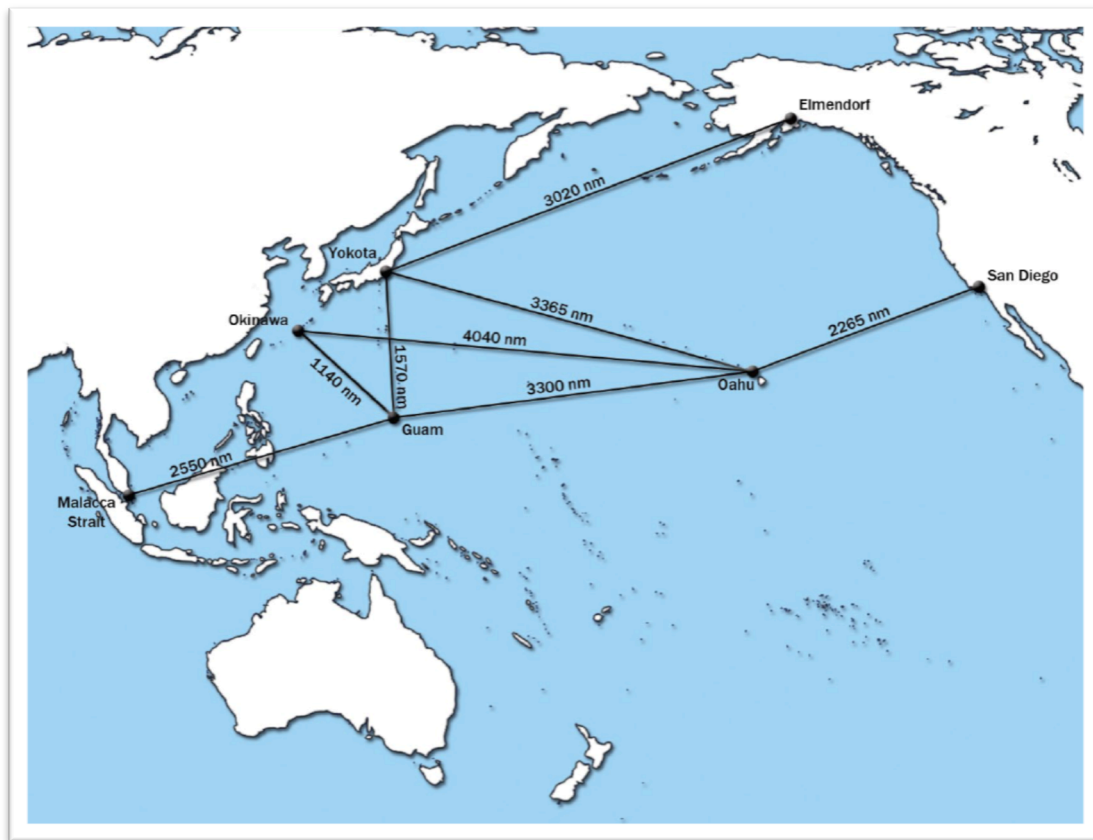
Characteristic #2: Geographic Scale

A Sino-U.S. conflict will be regional, yet geographically expansive, given that the actors’ opposing interests are centered in the WPTO. As Gompert et al. explain, “fighting would start and remain in East Asia, where potential flash points and nearly all Chinese forces are located” (2016, 11). The conflict will not be restricted to Mainland China since much of the tension between the two nations corresponds to territory to the east, such as Taiwan, Japan, the Korean Peninsula, and the Pacific islands. Both countries have bases throughout the Pacific, meaning that the launching and targeting of each other’s forces in the theater will cover a large expanse. For example, Chinese forces are located across Mainland China, along the coast, and

on the country's manmade islands in the South China Sea, which adds up to more than 20 air bases and over 10 naval bases (Office of the Secretary of Defense 2017, 11, 27, 30). Additionally, China is building bases overseas, such as in Djibouti (Office of the Secretary of Defense 2017, 5). However, it is unlikely that the conflict will spread beyond the Pacific since other regions are unrelated to China's goal of removing the United States' influence from the WPTO.

The United States has several key Pacific bases with sizable naval and air forces, such as in Hawaii, Guam, Japan, and South Korea (Heritage 2017). Additionally, the U.S. has others that it shares with its allies, including Taiwan, the Philippines, and Thailand, as well as several former bases on Saipan and Tinian, which it has considered re-opening (Heritage 2017; Van Tol et al. 2010, 81). However, even though the U.S. military has a sizable Pacific presence, China has a geographical advantage. Whereas Chinese forces are already located in the region in which the conflict will be fought, U.S. forces must travel thousands of miles to reach the Chinese islands, still several hundred miles from Mainland China. For example, Oahu, Hawaii is over 3000 miles from Guam, and the South China Sea is an additional 1,700 miles to the west (Van Tol et al. 2010, 12; Heritage 2017) [see Figure 1]. These large distances mean that the United States will not only need to have adequate forces in theater, but will also need to address a complex logistical situation, thereby making it exponentially more difficult for the U.S. to counter the Chinese threat.

Figure 1. “Illustrative Distances in the Pacific Theater”



(Van Tol et al. 2010, 12)

Advantage #2: Effective Range

Based on the scale of a Sino-U.S. conflict, a significant advantage of airpower is its effective range, which will enable the U.S. military to mitigate these geographic challenges. For the purpose of this analysis, “effective range” is the maximum distance that a platform can travel within a set amount of time in order to be within striking range of a target. This definition considers both speed and distance because the time it takes a platform to travel to a given location is often just as important as its ability to reach the location.

Airpower’s effective range advantage is first and foremost a result of air platform speeds. The average maximum airspeeds of USN and USAF air assets range from 180 mph for

helicopters, to 1,500 mph (Mach 2) for fighter jets (U.S. Navy; U.S. Air Force). Most notably, the USAF's F-15E *Strike Eagle* can travel as fast as Mach 2.5, meaning that it can travel 2,000 miles, the equivalent of the distance from Guam to the Chinese coast, in less than one hour (U.S. Air Force 2005). The significance of this speed is apparent when contrasted with that of naval forces. The average maximum speed of a USN submarine is 28 mph (25 knots), while the speed of an aircraft carrier, and therefore of the ships accompanying it, is 35 mph (30 knots) (U.S. Navy). Put simply, airpower has a notable advantage because it can reach a target much quicker than seapower. Additionally, aircraft can travel sizable distances. Many of the USN's and USAF's aircraft can travel between 1,000 and 7,000 miles; with aerial refueling, this range increases exponentially (U.S. Navy; U.S. Air Force). The USAF's B-52 *Stratofortress* in particular can travel over 8,000 miles without aerial refueling, which means that it can easily fly from Guam to Beijing and back (U.S. Air Force 2015). Given the scale of the conflict, these ranges are quite significant because airpower can rapidly access distant or landlocked parts of the theater that other conventional forces, such as seapower, cannot.

The importance of airpower's effective range in a conflict of this scale is exemplified in the Pacific War (1941-1945). During World War II, the United States faced similar geographic challenges to a Sino-U.S. conflict, with each side's forces and targets scattered throughout the WPTO (Feltus). As a result, the U.S. relied heavily on airpower to strike distant targets that seapower and landpower alone could not strike. According to John Pike, "Japan's geographical situation determined that the Pacific war should in large measure be a war for control of the sea, and to insure control of the sea, for control of the air over it", which meant that the United States' victory was largely the result of naval airpower's "decisive role" (2013). Over a three and

a half year period, U.S. aircraft traveled large distances, much more rapidly than naval and amphibious forces, to launch decisive strikes on Japanese military and industrial targets. Land-based and carrier-based fighters and bombers decimated the Japanese fleet at the Battles of Coral Sea and Midway, Japanese forces on islands throughout the Pacific such as the Solomon Island chain, and, much of the civilian population and infrastructure in cities across Japan (Feltus). Due to its effective range, airpower had a large impact on the outcome of the Pacific War. Hence, given the similar geographic scale of a Sino-U.S. conflict, airpower will likely play an equally important role.

With regard to a future conflict in the WPTO, consider the following example. Once fighting commences, the United States will likely want to strike China's aerospace command and control facilities in order to hinder Chinese attacks on U.S. satellites and communications systems (Van Tol et al. 2010, 58-59; Air-Sea Battle Office 2013). There are several key command facilities located throughout China, including the Beijing Aerospace Command and Control Center and the Xian Satellite Monitoring and Control Center (Van Tol et al. 2010, 59). Strong Chinese coastal defenses will likely prevent USN ships from getting close enough to the Chinese coast to launch a sizable attack on these sites (Gompert et al. 2016, 77). Given the scale of the conflict, it is also probable that these ships will be engaged elsewhere in the WPTO and will take a long time to travel close enough to China to be within weapons range.

Airpower, on the other hand, is less affected by these limitations. The United States will be able to launch aircraft from both aircraft carriers and nearby air bases, such as in Japan and South Korea, in order to quickly attack mainland facilities. For example, according to Van Tol et al., "Navy fighters operating well away from their carriers, which would remain outside the

PLA's A2/AD threat range, could play an important role" by "severely [limiting] the PLA's space-based situational awareness, [and] seriously compromising its ability to attack US space systems" (2010, 58). In other words, airpower can project into areas that ships and ship-based conventional weapons cannot rapidly and reliably reach. Airpower's effective range, compared to that of other conventional forces, will help the United States address the geographic challenges of a Sino-U.S. conflict.

Characteristic #3: Complexity

This potential conflict will be extremely complex because the actors will likely engage across several domains, particularly sea, air, space, and cyberspace.² According to Heginbotham et al., it "would be an immensely complex affair, with surface, air, missile, and subsurface elements supported by space and electronic elements that would, themselves, be contested" (2015, 18). This intricacy is largely the result of China's development of advanced weapons. Whereas in previous decades the United States' military capabilities vastly exceeded those of China, China today possesses many comparable platforms that pose a direct threat to the United States and its allies. This change is clearly articulated by the Office of the Secretary of Defense, which states that "China's military modernization is targeting capabilities with the potential to degrade core U.S. military-technological advantages" (2017, ii). For example, China

² The geography of the WPTO and the dispersion of U.S. and Chinese forces throughout the theater mean that a U.S. land invasion is highly unlikely. From the onset, the United States does not have a large incentive to rely on its land-based capabilities since China already has superior ground forces in the region: the PLA Ground Forces (PLAGF) consist of over 1.6 million troops, making it the world's largest standing army (Mizokami 2014; Office of the Secretary of Defense 2017, 22). Moreover, land forces would be largely inefficient for the United States to employ due to the logistical challenges of transporting them throughout the theater. As a result, according to Gompert et al., "although ground combat could occur in certain scenarios (e.g., a conflict over Korean unification), we exclude the possibility of a huge land war in Asia" (2016, 11).

has advanced cyber warfare technology that can be used to disable U.S. satellites or launch cyber attacks on military and civilian communications systems (Air-Sea Battle Office 2013, 3-4; Van Tol et al. 2010, 20). An attack of this kind is plausible because, as Van Tol et al. explain, “the PLA is very aware of the US reliance on space systems for ISR, C2, communications, precision navigation, and precision timing” (2010, 19). Additionally, China has cutting-edge radar and sensor systems, nuclear and diesel submarines, bombers and fighter jets, an aircraft carrier, and over 100 PLA Navy (PLAN) ships (Van Tol et al. 2010, 18-19; Office of the Secretary of Defense 2017, 94). Many of these aircraft can travel up to 1,000 miles, putting them well within range of the Korean Peninsula and Japan (Van Tol et al. 2010, 18). Most importantly, China has an array of advanced conventional strike capabilities, some of which reach as far as 2,000 miles (Office of the Secretary of Defense 2017, 32-33, 95). These weapons include thousands of “precision-guided conventional land-attack and anti-ship cruise and ballistic missiles” that can be launched from land, air, and naval platforms throughout the WPTO (Van Tol et al. 2010, 18). Given these diverse capabilities, China can effectively threaten, and strike, the United States’ Pacific allies and bases, as well as its carrier strike groups operating in the region. In turn, the United States military will have to address a complex set of threats across the domains of sea, air, space, and cyberspace.

The United States does not have enough assets to engage China in all domains simultaneously. As addressed in the previous sections, this is largely due to the unpredictability and geographic scale of the conflict, both of which are obstacles that the United States must overcome. In addition, as Heginbotham et al. explain, its complexity will make it “virtually impossible for the United States to maintain a decisive 24/7 presence” throughout the region

(2015, 2). Therefore, the U.S. military must distinguish between the numerous threats to its Pacific presence and address those that are most pressing.

Advantage #3: Precision

Given the complexity of this conflict, a significant advantage of airpower is that it can be extremely precise in terms of where and how it applies force. While land and naval forces do have advanced precision weapons, such as the *Arleigh Burke* class destroyer's Tomahawk cruise missiles, these forces lack the agility and theater-wide mobility of aircraft. Airpower, on the other hand, can "concentrate military force in time and space, when and where it is required", to deliver measured damage (Ministry of Defense 2009, 17). Moreover, modern aircraft have a high payload-to-platform ratio, largely due to their ability to carry extremely powerful precision-guided munitions. For example, the USAF's B-2 *Spirit* can carry weapons ranging from small diameter bombs, which are exact enough to obliterate a single room while leaving the surrounding infrastructure intact, to the Massive Ordnance Air Blast (MOAB) bomb, one of the United States' most destructive non-nuclear bombs (U.S. Air Force 2015). According to Air Force Doctrine Document 1, these capabilities "enable a relatively small number of aircraft to achieve national- or theater-level objectives", which in turn allow the military to "forgo the brute force-on-force tactics of previous wars and apply discriminate force precisely where required" (1997, 20, 30). For example, a squadron of aircraft can be deployed to destroy a single building, or, an entire power grid. Most importantly, airpower has such a large precision advantage because aircraft can rapidly travel to a target, strike exactly and quickly, and then immediately depart. Other forces lack the ability to deliver accurate strikes while also retaining this degree of mobility. According to the British Ministry of Defense, "the differences in speed of

manoeuvre between land and air forces” highlight the extent to which “precision air attack can now decisively shape the operational battle space” (Ministry of Defense 2009, 30). Hence, airpower can be relied upon to precisely project, and deliver, force in ways that other platforms cannot.

A historical air campaign that demonstrates this advantage of airpower is that of the Libyan Civil War (2011). During this conflict, the coalition forces, which consisted of NATO member states and regional actors led by the United States, conducted a limited air campaign, rather than a land invasion, from NATO bases and aircraft carriers staged in the Mediterranean Sea (Alegi et al. 2015). The purpose of this campaign was to hinder Gaddafi’s oppression of a nationwide rebellion, minimize civilian casualties, and enable rebel forces to overthrow the dictatorship (Greenleaf 2013, 28). Early on, naval forces formed a blockade and were responsible for launching surface-to-surface strikes. However, they were soon supplemented with selectively applied airpower, which thereafter became the main military force. During an operation targeting Gaddafi’s loyalist forces, NATO aircraft struck several tanks hidden in a marketplace, leaving behind just three holes and limited collateral damage (Alegi et al. 2015, 53). In a different operation, coalition aircraft struck a loyalist 155mm howitzer, thereby enabling rebel forces to recover part of a city “that was essential to sustaining their fighters and civilian population” (Alegi et al. 2015, 52-53). This precision, and a parallel commitment to preventing civilian casualties, was set as the standard throughout the conflict. Coalition leaders understood that the only way to disable Gaddafi’s offensive was to accurately eliminate threats to local forces, as they alone had the civilian support, territorial familiarity, and personal commitment necessary for fighting the civil war. As Alegi et al. explain, by employing airpower

to strike specific targets rapidly and precisely, coalition forces “acquired an almost-legendary status because of the precise degree of destruction” (2015, 53). For this reason, according to former NATO Secretary General Anders Rasmussen, the coalition air campaign was “effective, flexible and precise”, and played a central role in determining the outcome of the conflict (NATO 2011). The air campaign in Libya is an excellent example of how the precise application of airpower, particularly in the absence of conventional land forces and as a supplement to naval forces, can have a significant impact on the outcome of a conflict.

This advantage of airpower is also applicable to a Sino-U.S. conflict. Consider the case of Chinese intervention on the Korean Peninsula. If fighting breaks out, whether due to a North Korean attack on South Korea or Japan, the collapse of the Kim regime, or conflict between North Korea and the United States, China may quickly send land, naval, and air forces to the region in an attempt to expand its regional authority (Gompert et al. 2016, 8). During this conflict, as discussed previously, the United States will face a geographic disadvantage and will take longer than China to transport a sizable amount of forces to the Peninsula. For example, in terms of seapower, the United States may not have enough time nor an adequate number of ships in the area to immediately engage and defeat the entire PLA Navy (PLAN), which consists of over 100 combat-ready ships and more than 50 submarines, as well as disable the dozens of advanced weapons systems located close to Japan and the Peninsula (Office of the Secretary of Defense 2017, 27). In turn, rather than solely fighting force-on-force, the U.S. will also be able to employ the speed, agility, and significant precision weapons capabilities of its aircraft to strike specific operational and logistical centers, thereby disabling numerous interdependent Chinese platforms and weapons systems.

According to the Air-Sea Battle Office, one of the U.S.'s main priorities will be to strike locations that "challenge U.S. freedom of action by causing U.S. forces to operate with higher levels of risk and at greater distance from areas of interest" (2013, 3). These critical targets may include command and control centers, such as the Joint Operations Command Center and the Wuhan Joint Logistic Support Base, key radar and sensor systems, including the over-the-horizon radar (OTHR) systems near Fuzhou, and, A2/AD capabilities, such as the naval bases in Qingdao and Ningbo (Office of the Secretary of Defense 2017, 2, 27; Van Tol et al. 2010, 59). Moreover, the United States may strike targets on the Peninsula, such as the homes of North Korean leaders (as part of a decapitation strategy), or the supply chains of Chinese and North Korean forces (as part of an air interdiction strategy) (Pape 1996; Warden 1988). It is important to recognize that, although the United States will not target Chinese civilian populations, aircraft may operate in urban areas where military, industrial, and leadership targets are located. Oftentimes, discussion about this conflict centers on Sino-U.S. engagements at sea or on distant islands. However, the reality is that many strikes may occur in densely populated urban areas, such as in Mainland China, Japan, Taiwan, or the Korean Peninsula. As a result, airpower's precision will not only be necessary for effectively eliminating targets, but also for avoiding civilian casualties [see Appendix B for a discussion about civilian casualties]. Just as in Libya, a limited amount of airpower can be selectively applied to strike key targets that have critical implications for the rest of the conflict. Thus, airpower's precision, more so than that of seapower and landpower, makes it well suited for this engagement in the WPTO.

Counterarguments

Critics of the use of airpower in a Sino-U.S. conflict may identify several disadvantages

with regard to each of the three characteristics I have discussed. First, in terms of the unpredictability of the conflict, some may argue that, because airpower is versatile, its assets can easily be spread too thin as unexpected threats emerge, thereby rapidly decreasing airpower's impact over time. Given that the U.S. will likely be attacking a range of targets across several warfare domains, aircraft may be relied upon to carry out numerous tasks in addition to their primary roles. For example, the F/A-18E/F *Super Hornet* may be relied upon to escort aircraft carriers in dangerous waters, conduct reconnaissance, and provide close air support, as well as carry out its fighter responsibilities (U.S. Navy 2009). In a conflict where these missions will likely occur simultaneously, a heavy reliance on the finite number of aircraft in the WPTO may make the aircraft less accurate and the missions more dangerous. Moreover, joint airpower operations may not be able to happen on a large enough scale if aircraft are tasked with too many responsibilities. These disadvantages are clearly articulated in Air Force Doctrine 1, which asserts that excess demand for air forces "may result in the fragmentation of the integrated air and space effort in attempts to fulfill the many demands of the operation", thereby "delaying or diminishing the attainment of decisive effects, and increasing the attrition rate of air forces" (1997, 26). For these reasons, although airpower's versatility is a significant advantage, a counterargument may be made that an over-reliance on aircraft to accomplish both their primary roles and auxiliary responsibilities will rapidly dilute their effectiveness.

In terms of the geographic scale of the conflict, a second counterargument is that U.S. airpower is too heavily dependent on Pacific bases and aircraft carriers. Some may note that aircraft fueling and maintenance are constant concerns, since aircraft must be grounded regularly. In contrast, they may argue, naval forces can be refueled at sea and maintained for

months at a time without returning to port. These limitations are further compounded by the large distances between secure locations in the WPTO where aircraft can takeoff and land, as well as by platform restrictions: USAF aircraft are strictly land-based, the USN's FA-18 *Hornet* is the only carrier-based fighter, and the proximity of these bases to targets directly affects which strikes can be carried out (U.S. Air Force; U.S. Navy). Most importantly, the infrastructure upon which airpower depends is nearly impossible to protect fully since it is highly vulnerable to Chinese attack. According to Gompert et al., "the Chinese regard U.S. aircraft carriers and regional air bases as prime targets", which means that "U.S. losses of surface naval and air forces, including disabled aircraft carriers and regional air bases, could be significant" (2016, xii, 13-14). For example, the Chinese may use their Dong-Feng 21 anti-ship "carrier-killer" cruise missiles, or their advanced *Chengdu* J-20 fighters and *Xian* H-6 bombers, to strike the United States' carriers and bases, thereby rendering them unusable (Office of the Secretary of Defense 2017, 28, 31). As a result, some may argue that the dispersion and vulnerability of the bases and platforms upon which airpower depends will limit its application.

With respect to the complexity of the conflict, a final counterargument is that airpower can be too precise, which will make air campaigns completely ineffective. According to Daniel Gouré, it is possible for airpower to be "too selective and too antiseptic" (2011). This is particularly relevant when considering the PLA's size and capabilities. For example, if airpower is only used for eliminating specific parts of operational and logistical centers and weapons systems, Chinese forces may be hindered, but not fully disabled. As explained in Air Force Doctrine Document 1, "the misuse or misdirection of air and space power", whether due to faulty decision-making or unnecessary precision, "can reduce its contribution even more than

enemy action” (1997, 18). In other words, some may believe that, if leaders place too large of an emphasis on striking only specific targets and minimizing all collateral damage, attacks will have little impact on the conflict.

Response to Counterarguments

While these counterarguments highlight important drawbacks to the use of airpower in a Sino-U.S. conflict, they do not prove that airpower will be ineffective. These disadvantages can be mitigated, such that they are outweighed by the advantages on all accounts.

First and foremost, there are several ways in which the United States can minimize the overextension of airpower. In order to increase the number of available aircraft, U.S. forces can operate jointly with regional allies. These nations may include Australia, Taiwan, Japan, and South Korea, as well as many smaller Southeast Asian nations (Van Tol et al. 2010, 30-31) [see Appendix C for a discussion about allied involvement]. Although allied forces lack many of the advanced capabilities of U.S. forces, their participation may prove pivotal. For example, according to Gompert et al., Japanese involvement “could increase Chinese losses and offset or even reduce U.S. losses in a long, severe conflict” (2016, 58). Japan possesses nearly 700 fighter and attack aircraft, with a total force size of approximately 1,600 aircraft (Global Firepower 2017). Given these assets, Japan will be able to contribute significantly to the United States’ ability to strike a wide range of Chinese targets. The same can be said for other Pacific allies. Since a Sino-U.S. conflict will impact nations throughout the WPTO, allies will likely be willing to provide aircraft, bases, and other military assets, thereby enhancing the United States’ airpower capabilities.

Moreover, the United States can limit overextension by setting up a target prioritization

system. This will mandate that aircraft first strike key operational and logistical centers before military leaders are able to assign the aircraft to second and third order priorities. For example, aircraft may first have to attack immediate threats to the United States' assets, such as incoming PLA missiles and aircraft, as well as the central operational and logistical centers that support these Chinese capabilities (Warden 2000). Once immediate threats are eliminated, U.S. aircraft may strike other large, but less urgent, targets that support the PLA, such as industrial centers, transportation infrastructure, shipping and trade, and civilian leadership (Van Tol et al. 2010, 76; Ministry of Defense 2009, 31). These guidelines are broad enough to allow for airpower to be responsive in the face of dynamic threats, but strict enough to ensure that airpower is distributed efficiently. An expansion in the number of available air platforms due to allied support and the establishment of clear rules for target prioritization will ensure that airpower can be applied in both breadth and depth.

Second, although aircraft are traditionally reliant on land bases and aircraft carriers, other assets in the region can be adapted to serve the same purpose. If airstrips are rendered unusable, paved roads and relatively level unpaved roads can be cleared of vegetation and debris, and converted into runways. This has been done before: in 2016, the USAF landed four *A-10 Thunderbolt* jets on a rural road in Estonia, and other foreign Air Forces have conducted similar operations (Browne 2016). Though these makeshift runways may require the installation of modified lighting patterns and radio control towers, they are a feasible solution. Additionally, if aircraft carriers operating in the region are either sunk or are unable to sail to a position where their aircraft are in range of Chinese targets, other platforms can be used. For example, the USN's amphibious "big deck" ships, such as the LHA and LHD amphibious assault ships, are

capable of launching various USN aircraft (U.S. Navy 2017). Though smaller than aircraft carriers, they have comparable aircraft launching capabilities and are (slightly) more expendable. Therefore, even if traditional landing platforms are inoperative, there are viable alternatives.

Finally, the counterargument that airpower can be too precise raises a valid point, but not one that pertains to airpower alone. Landpower and seapower, as well as space and cyberspace capabilities, have the potential to target too few threats using inadequate force, yet this possibility does not invalidate their application. Consider the use of ship-based missiles to strike surface targets: although these weapons can destroy sizable assets, such as weapons systems, submarines, and ships, their individual usage may not guarantee a victory in a complex conflict. The same can be said for landpower, which may be unable to eliminate a sizable amount of enemy assets due to mobility and weapons limitations, as well as cyberspace operations, which may be incapable of accessing and disrupting key systems. For these reasons, forces must be employed jointly across all war fighting domains in order to increase their effectiveness.

In turn, the same can be said for airpower. Air platforms are not inherently too precise. Rather, ineffective application of airpower is the result of poor decision-making by military leaders and a lack of coordination with other forces. When applied in adequate breadth and depth, airpower can complement and assist other U.S. forces fighting the PLA across the domains of land, sea, air, space, and cyberspace by eliminating specific threats that other conventional capabilities cannot access as easily. Airpower alone will not win the conflict. However, its significant advantages, in comparison to its relative disadvantages, will make it a

cornerstone of U.S. operations in the WPTO.

Policy Recommendations

The United States military has made great strides in preparing for a Sino-U.S. conflict. Most notably, the USN and USAF have adopted the AirSea Battle operational concept and have conducted joint training exercises, such as Exercise Valiant Shield, that simulate a conflict in the WPTO. However, the adversaries we face today will not be the same a year from now, let alone ten years from now. Therefore, we must continue to adapt our forces, refine our strategy, and remain vigilant. In turn, I have several policy recommendations.

First and foremost, the U.S. Armed Forces need to train comprehensively to prepare for this potential conflict. This includes tasks ranging from the tactical level to the strategic level. For example, as discussed in the previous section, both USN and USAF pilots should learn how to land on roads and “big deck” ships. Moreover, the military should conduct joint training exercises in which a limited number of aircraft must follow regulations for target strike priorities that are specific to different Sino-U.S. conflict scenarios. The overarching purpose of these trainings is to ensure that our forces not only communicate well, but also understand, and enhance, each other’s capabilities. Furthermore, through these exercises, military leaders will be able to truly comprehend the threats that the U.S. faces in the WPTO and the specific ways in which available platforms can be applied.

Second, the United States must strengthen relationships with Pacific allies by including them in joint training exercises and compelling them to improve their own military capabilities. Historically, many nations in the region have depended on the United States for military protection. However, even though the U.S. and China will be the main actors in a Sino-U.S.

conflict, it will affect the political and economic conditions of these nations, as well as potentially occur on their own soil. As previously discussed, the United States will be hard pressed to fight China on its own. Therefore, U.S. leaders need to compel allies to contribute as best they can to U.S. efforts in the region, whether by volunteering military forces and bases or by placing political and economic pressure on China.

Third, elected officials should continue to update our military's assets. I am not advocating for excessive spending on advanced platforms, such as the new *Zumwalt*-class destroyer, whose enormous costs may outweigh their impressive capabilities. Rather, the government needs to consider the characteristics of the conflict and which platforms are truly necessary. Funding should be directed towards building more long-range aerial refueling aircraft, such as the Boeing KC-46 *Pegasus*, an array of medium- and long-range strike and attack aircraft that can be launched from naval platforms, and, additional "big-deck" ships, such as the *America*-class LHA, to supplement aircraft carriers (Boeing; U.S. Navy 2017).³ These assets will help to alleviate some of the previously discussed challenges that the U.S. may face in the WPTO.

These policy recommendations speak to just a few of the many ways in which the United States must make changes in order to enhance its airpower advantages and overcome its disadvantages. As has been the norm throughout military history, it is only through continuous improvement that we will be able to counter and defeat our adversaries.

³ It is also worthwhile for the USN and USAF to consider further developing their unmanned platform capabilities. The USAF possesses an extensive drone program, which may have useful applications in the conflict. Additionally, the USN has experimented with carrier-based drones, such as the MQ-25 *Stingray* tanker and the MQ-4C *Triton* surveillance aircraft (Mizokami 2017; Cole 2017). Although more research needs to be conducted in this field, the fuel and weapons capabilities of these platforms, as well as the removal of risk to service member lives, make them flexible assets that are worthy of consideration.

Conclusion

Much is unknown about a potential Sino-U.S. conflict. Though experts may make educated predictions, there is no way to have complete certainty about what exactly will raise tensions and spark fighting, or what events will define the actual progression of the conflict. However, regardless of the way in which it develops, there are three defining characteristics that will directly affect how each actor is both willing and able to respond to threats posed by the adversary. First, the conflict will contain a large amount of uncertainty from the onset, and the United States will need capabilities that are both flexible and scalable. Second, it will take place on an extremely large geographic scale, spanning much of the WPTO. Though both actors will have to adapt to this expansiveness, this will pose a much larger challenge to U.S. forces than to the PLA. Finally, the conflict will be complex. Both actors possess sizable military capabilities and are heavily invested in gaining, or retaining, superiority in the region. As a result, U.S. forces must be prepared to engage across the domains of land, sea, air, space, and cyberspace, often simultaneously. By examining these three characteristics in conjunction, it is evident that a Sino-U.S. conflict will be multi-faceted, and quite unlike other military engagements in recent decades.

Given these defining characteristics, I have analyzed how airpower can be employed to address a diverse array of potential Chinese threats. Unlike other conventional forces, airpower is extremely versatile, possess a significant effect range, and can be applied precisely in both breadth and depth. In turn, by using a variety of air platforms in conjunction with other force capabilities, the United States will be able to fight dynamically and forcefully: aircraft can engage countless PLA platforms across various domains, access much of the WPTO to eliminate

key operational and logistical centers that underlie the PLA's offensive, defensive, and decision-making capabilities, and, provide support to other U.S. and allied forces. Just like all types of military force, airpower has its disadvantages. However, these limitations can be mitigated and do not outweigh its sizable advantages. Therefore, although much of this conflict is unpredictable, we can be certain that airpower, particularly joint USN and USAF airpower, will play a central role in U.S. efforts to defeat China and retain America's historical regional superiority.

In the coming decades, it is likely that other aggressors will emerge to challenge the United States' status as a political, economic, and military world power. Regardless of whether these threats are posed by Russia, North Korea, insurgent forces, or any number of other actors, the analysis that I have conducted in this essay can serve as a framework for continued discussions about the role of airpower in future conflicts, many of which will share certain characteristics. Our adversaries will continue to have complex objectives and considerable military capabilities, some of which we are unable to detect or fully comprehend. In turn, using this essay as a starting point, more research should be done to evaluate the degree to which the United States can use airpower to effectively respond to these dynamic threats. What will be the ramifications of space and cyberspace warfare for airpower? Are there limitations to airpower's ability to counter these increasingly advanced, asymmetric threats and military technologies? To what extent will our strategic frameworks, such as our joint operational concepts, actually be applicable to these conflicts? In what ways does our current approach to military planning and decision-making inhibit necessary innovation?

Airpower is not a foolproof tool that our military can use to address each and every

threat posed by our adversaries. Its strengths and weaknesses differ significantly between each conflict, and its effectiveness is contingent on a multitude of factors. Therefore, leaders and academics alike should continue to rigorously examine the applicability and resiliency of our current airpower capabilities across all possible scenarios. As history has taught us, it is only through continuous self-improvement that we will be prepared to address future threats to our assets, interests, and allies.

Appendix A: Potential Causes

While it is impossible to know the specific progression of a future conflict, we can make certain predictions about how the conflict may commence by examining several of the existing sources of tension between the two nations.

First and foremost, one of the central points of friction is China's construction of manmade islands for military purposes in the South China Sea. Since 2013, China has built up over 2,000 acres of land on reefs in the Paracel Islands and Spratly Islands, which are located over 500 miles from the coast of China and less than 200 miles from China's southern neighbors (Asia Maritime Transparency Initiative 2016; Asia Maritime Transparency Initiative 2017; Mingfu 2010; Ross 2017). Island building in this region is not a new phenomenon: Pacific nations, such as Vietnam, Malaysia, the Philippines, Taiwan, and Japan, have a history of dredging reefs and expanding territory in order to protect maritime trade and fishing interests (Watkins 2015; Ross 2017). However, China has taken this practice a step further by turning its islands into strategic military outposts. The Chinese have added airstrips, radar, and weapons systems so that, according to Alessio Patalano, they can "guarantee [Chinese] coverage of the whole of the South China Sea, in terms of radio and military range" (Asia Maritime Transparency Initiative 2017; Ross 2017). In turn, as China enhances its assets on distant islands, it poses a greater threat to the Pacific nations that have economic and military interests in the region. As a key ally to many of these nations, the United States will continue to execute freedom of navigation exercises using air and naval platforms (U.S. Department of State). However, as the islands become more fortified and the U.S. persists in challenging China's growing presence in international waters, both nations' commitment to military power projection increases the likelihood of conflict in the South China Sea.

Another source of tension between the United States and China is Chinese aggression towards Taiwan, which is likely to manifest in the form of an air and land invasion. For decades, China has opposed Taiwanese independence and has repeatedly threatened to "retake" the island nation, which it views as "a breakaway province", by force (BBC 2016). Though this potential conflict is not new, it is increasingly significant: as China further develops its military capabilities, it is more likely that it will attempt to violate Taiwanese sovereignty in an effort to demonstrate what it believes to be its regional authority (Gompert et al. 2016, 8; Office of the Secretary of Defense 2017, 6). For example, China has built up more than 25 airbases within airstrike range of Taiwan, as well as numerous other stationary and mobile ballistic missile systems further inland (Van Tol et al. 2010, 11). According to Ian Easton, a Chinese invasion of Taiwan "would be devastating to the current regional security balance" because "the United States would lose a democratic state and a valuable outpost in the far western Pacific", as well as "a major source of signals intelligence" (Bitzinger 2017, 1). Moreover, this invasion would likely guarantee a Sino-U.S. conflict since the United States, as an ally of Taiwan, is legally obligated to defend the island nation in the case of a Chinese attack (Van Tol et al. 2010, 13). China's aggressive positioning of its military assets in the direction of Taiwan clearly communicates its intentions, and, in turn, forces the U.S. and its allies to be on high alert.

Additionally, there are several other potential causes of conflict between China and the United States. According to David Gompert et al., these include “Sino-Japanese skirmishing over disputed territory in the East China Sea” and “uncoordinated military interventions by Chinese, South Korean, or U.S. forces in the event of a collapse of North Korea” (2016, 8). Though there are numerous ways in which a Sino-U.S. conflict may start, each deserving of its own analysis, they all boil down to a fundamental tension: China’s goal is to continuously expand its political, economic, and military presence in the Pacific, whereas the United States’ goals are to contain Chinese expansion and minimize the degree to which China infringes on U.S. and allied interests. Thus, as each nation continues to flex its military muscles, tensions will rise and an outbreak of conflict will become increasingly likely.

Appendix B: Civilian Casualties

The U.S. will try to minimize civilian casualties due to national and conflict-related factors. Civilian casualties are defined as “physical injury or death from military operations” (Kolenda et al. 2016, 10). Within the United States, high levels of these casualties may decrease popular support of the war and lead to increased political oversight and control of the military. This is because, when civilian casualties occur, American citizens and leaders tend to believe that the military is not operating as morally and precisely as it should be (Larson and Savych 2007, xx-xxii). As Eric Larson and Bogdan Savych explain, “national political and military leaders appear to attach a great deal of importance to avoiding collateral damage and civilian casualties during U.S. military operations” due to “a desire to reduce the inhumanity of warfare for innocent civilians” and a realization that “concern about casualties shapes the constraints that are imposed on military operations” (2007, xvii-xviii). If casualties are high while the resultant military gains are comparatively low, U.S. leaders may respond with increased regulation of the military (Kolenda et al. 2016, 5, 53; Gompert et al. 2016, 12). Therefore, in order to retain control of decision-making and minimize the loss of domestic support, the military will try to avoid killing civilians.

Second, civilian deaths may only strengthen China’s commitment to a Sino-U.S. conflict. As is evident in China’s political rhetoric, the nation is fully committed to achieving its objectives in the WPTO. This is clearly articulated by The State Council Information Office of the People’s Republic of China, which states that the nation will not be dissuaded from “[safeguarding] its national unification, territorial integrity and development interests” because it is committed to “realizing the Chinese Dream of achieving the great rejuvenation of the Chinese nation” (2015). If the United States kills Chinese citizens, Chinese leaders may use this news to strengthen their argument about the harmful role that the United States plays in the region, thereby justifying aggression towards the U.S. (Gompert et al. 2016, 52; Mingfu 2010). This rhetoric will increase Chinese commitment to the conflict and make U.S. efforts more difficult and costly. Thus, it is in the United States’ best interest to minimize these casualties.

Though the United States military will try to avoid striking population centers, it may still target infrastructure, government buildings, and industry. According to the Air-Sea Battle

Office, one of the U.S.'s main priorities will be to take out China's A2/AD capabilities because they "challenge U.S. freedom of action by causing U.S. forces to operate with higher levels of risk and at greater distance from areas of interest" (2013, 3). For this reason, striking certain assets that are in civilian areas may have benefits that outweigh the costs. For example, the United States may target Chinese systems that affect both the military and civilian leadership, as well as the general population, such as data communications networks and commercial shipping operations (Gompert et al. 2016, 19; Dobbins et al. 2017, 6). Though attacks on these assets may result in civilian casualties, they will also have a significant impact on U.S. efforts. However, even though the U.S. military may permit a limited number of casualties for certain operations, civilian deaths in the conflict as a whole will be minimal due to their implications for the United States' regional objectives.

Appendix C: Allied Involvement

The involvement of U.S. and Chinese allies will vary depending on how the conflict begins and develops. In the Pacific, the United States' potential allies include Taiwan, Japan, and South Korea, as well as many smaller Southeast Asian nations (Van Tol et al. 2010, 30-31). If China initiates the conflict on allied territory, the affected nations will likely be drawn into the fighting (Gompert et al. 2016, 8; Air-Sea Battle Office 2013, 3). For example, if China strikes U.S. bases in Japan, Japanese leaders, such as Prime Minister Abe Shinzo, have indicated that Japan will operate jointly with the United States (Matake 2014). According to Gompert et al., Japanese involvement "could increase Chinese losses and offset or even reduce U.S. losses in a long, severe conflict" (2016, 58). Additionally, most other Pacific nations, such as Australia and Singapore, as well as certain European nations and NATO, will likely commit small military forces, allow the United States to operate on their bases, or place economic restrictions on China (Gompert et al. 2016, 57-59; Van Tol et al. 2010, 51). In turn, although much of the allied involvement will depend on how the conflict commences, the U.S. can expect a certain amount of support.

China, on the other hand, has much fewer allies because it is an outsider to the historical U.S.-centric alliances in the region. As a result, according to Robert Kagan, China "can call on few allies of its own for assistance" (2017). Moreover, the allies it may have in a Sino-U.S. conflict, particularly Russia and North Korea, are very unpredictable (Gompert et al. 2016, 56-57). For example, it is unclear exactly how Russia will assist China: Russia may provide China with economic support, contribute military forces or weapons, completely avoid the conflict, or, according to Gompert et al., "exploit U.S. preoccupation in the Pacific to increase threats to former Soviet states in Eastern Europe (e.g., Ukraine) and the Caucasus (e.g., Georgia)" (Mujamdar 2017; Gompert et al. 2016, 56). North Korea is an even less predictable ally. Though the final Russian scenario is merely speculative, it is indicative of the fact that China's allies will only get involved if and when the conflict concerns them and their regional interests.

As the conflict increases in scope and duration it will have a greater impact on regional security, politics, and economies, thereby drawing in the specific nations that are affected.

However, given the unpredictability of how the conflict will start and progress, allied involvement is quite hypothetical. In turn, the United States and China will likely enter a Sino-U.S. conflict without a heavy dependence on allies.

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