CHAPTER 5

Can China Become a Maritime Power?

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Despite possessing a coastline some 7,830 nautical miles long and some 3,400 offshore islands, China has pursued maritime development in an atmosphere of considerable uncertainty.[1] The nation has long been a continental power with a feeble navy, but recent assessments suggest that this historic pattern is changing. China appears increasingly determined to create a modern navy. But—while the possibility cannot be excluded outright—it seems that China is not developing long-range power-projection capabilities. Rather, Beijing seems to be constructing a navy geared to achieving asymmetric sea-denial capabilities on its immediate periphery in order to defend its growing maritime interests, and in particular to resolve the volatile Taiwan issue. Nevertheless, its combat potential should not be underestimated.

At least for now, Beijing does not seem intent on fielding carrier battle groups. Therefore, the PLAN is developing very differently from most other large navies, and from the U.S. Navy in particular. Chinese naval strategists seem to embrace their own universal logic of sea power, with both Mahanian and Marxist undercurrents. Despite these foreign influences, however, they insist that China has not, and will not, replicate the martial patterns of the West. Yet, exceptionalism aside, Chinese naval development today seems to be constrained less by ideology than by capabilities. A concerted effort to improve these capabilities is clearly underway and enjoys the sustained support of China's leadership. More relevant questions are, therefore: What kind of force structure will allow China to execute its strategies effectively, thereby achieving its political objectives? How feasible are China's plans for force-structure development, and how long will it take to fulfill such plans? A close examination of these and other developments will furnish insights into how strategic thought influences Chinese maritime strategy.

Particularly uncertain is the extent to which China will seek to project power beyond its shores. Will China seek "command of the sea"? If so, what will be the essence and implications of "command of the sea with Chinese characteristics"? In short, can China become a true maritime power?

This chapter, which selectively surveys aspects of China's naval development in order to elucidate the trajectory of its growing sea power, will proceed in seven steps. A section on latest developments and assessments will survey China's 2006 Defense White Paper Summary and the 2006 U.S. Department of Defense report on China's military modernization. The next section, on force structure, will examine China's military budget; submarine force; MIW (mine-warfare) capabilities; surface ships; amphibious forces; naval air force; command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) capabilities; and deck aviation ambitions. Subsequent sections will consider China's base infrastructure, training, and doctrine. Inferences about China's naval modernization plan will then be offered, followed by implications for regional naval relations and an overall assessment.

Latest Developments and Assessments

China's maritime potential is clearly being debated in Beijing. A remarkable Chinese government study entitled *The Rise of Great Powers* attempts to determine the reasons why nine nations became great powers. Conceived on November 24, 2003 at a Communist Party of China Central Committee Political Bureau group session and completed in 2006, it draws on the analyses of many top Chinese scholars. *The Rise of Great Powers* suggests that national power stems from economic development, which is fueled by foreign trade and in turn can be furthered by a strong navy. This latter connection is emphasized by Senior Captain Liu Yijian of the People's Liberation Army Navy (PLAN or PLA Navy). Writing in China's foremost military journal, *China Military Science,* Liu states that "Possession of a big and powerful naval force [is] of great strategic importance in defending national security, promoting a nation's economic development, and maintaining a nation's international standing."[2]

PLAN Senior Captain Xu Qi builds on this theme, emphasizing that "China's . . . maritime geostrategic relationships . . . are undergoing profound change. . . . China's navy must make [important] strategic choices."[3] For Xu, China's strategic future lies at sea. China, with its "very long shoreline, numerous islands, vast administered sea areas, and abundant ocean resources," is naturally a great maritime power. The nation's "coastal seas and continental-shelf areas [combine to] approach 273 million hectares," he points out. "This area is more than two times that of China's total arable land." For China, with "the world's largest population and relatively deficient resources," the sea can thus "serve as a strategic resource replacement area." Rather than envisioning enduring Chinese vulnerability at

sea, Xu views China's navy as a vehicle for asserting Chinese sovereignty abroad: "Naval vessels are symbols of state power and authority [which] can act as 'mobile territory' and freely navigate the high seas of the world. . . . [T]heir mission is not limited to offshore defense." For all these reasons, China's navy must "unceasingly move toward [the posture of] a "blue-water navy" [and] expand the scope of maritime strategic defense. . . ."

By contrast, in an unusually explicit acknowledgment of the growing internal debate concerning the purposes and priorities of China's future military development, Beijing University scholar Ye Zicheng maintains that "in the current stage we must regard the building of China's land homeland as the central task and develop land power as the strategic focus, [while] the development of sea power should be limited and should serve and be subordinate to the development of land power." For China, Ye explains, "possession of strong sea power is an inevitable choice . . . however . . . strong sea power must be and can only become a component part of China's land power." China's natural status as a land power, Ye writes, means that its development "can only be based on internal land space, and the development of sea space and expansion abroad can only be important supplements." China's strategists must remember "the lesson of the late Qing: When there are major problems in the building of a country's system, it is impossible to become a sea power just by developing maritime military forces." Yet Ye's emphasis on land power "does not exclude the development of China's sea power, because China's sea power is very far from meeting the needs of its land power."[4] This assessment is supported by the 2005 edition of the PLA's first authoritative volume on strategy, edited by two major generals: ". . . because the borders and coasts are far away from our central inland, some at a distance of hundreds or even thousands of kilometers, it is very difficult for the projection of forces, operations, logistics and supports."[5] Since Beijing is unlikely to issue definitive policy statements concerning these important issues, its recent behavior must be examined for clues as to its actual maritime trajectory.

At a Communist Party meeting held on December 27, 2006, Chinese president Hu Jintao declared, "we should strive to build a powerful navy that adapts to the needs of our military's historical mission in this new century and at this new stage" and is prepared "at any time" for military struggle.[6] "In the process of protecting the nation's authority and security and maintaining our maritime rights," Hu emphasized, "the navy's role is very important."[7] Hu added that China's "navy force should be strengthened and modernized"[8] and should continue moving toward "blue-water" capabilities.[9]

Hu's words followed an incident on October 26, 2006, when a Chinese diesel submarine reportedly surfaced within 8 kilometers of the U.S. Navy aircraft carrier *Kitty Hawk* as the carrier operated near Okinawa. The incident perhaps suggested a new era of skill and confidence among Chinese submariners. Indeed, Admiral William Fallon, then the commander of the U.S. Pacific Command,

stated that *Kitty Hawk* had failed to detect the Chinese submarine.[10] While the specifics of this incident remain unclear, at a minimum it highlighted the inherent difficulty in detecting a diesel submarine.

These Chinese naval developments took on larger strategic significance on January 11, 2007, when China reportedly demonstrated a direct-ascent antisatellite capability. A mobile, solid-fueled *Kaituozhe-1* space launch vehicle, probably launched from Xichang Launch Center in Sichuan province, lofted a kinetic kill payload into low-earth orbit aboard a ballistic missile in order to physically destroy one of its (aging) weather satellites, *Feng Yun 1C,* at an altitude of approximately 865 kilometers.[11] Only hours before, Lieutenant General Michael Maples, director of the U.S. Defense Intelligence Agency, had told the Senate Intelligence Committee that "Russia and China continue to be the primary states of concern regarding military space and counterspace programs." Several months before, Dr. Donald Kerr, director of the National Reconnaissance Office, had confirmed that a Chinese ground-based high-energy laser had "illuminated" a U.S. satellite in low-earth orbit without interfering with the satellite's operations.[12]

Taken together, these events suggest that, just as Beijing is determined to prevent the United States and other foreign powers from dominating China's maritime periphery, it will also maintain a strategic stake in the aerospace dimension that is so critical to modern maritime power projection. As James Holmes points out, "Beijing regards the seas and skies adjacent to China's coasts as a 'commons' through which commerce, shipments of raw materials and military power can flow freely. A rising China is increasingly reluctant to entrust the security of this commons to uncertain U.S. goodwill."[13] Senior Captain Xu offers a naval context for this event: "Outer space. . . has become China's strategic interest and new 'high ground.' . . . [This] is beneficial for enhancing the information strength to safeguard our sea power."[14] Senior Captain Liu Yijian adds, "the struggle to seize space superiority will directly affect the course and structure of maritime combat operations, and it will inevitably have a huge influence on the struggle for command of the sea in the future."[15]

White Paper Summary

China's 2006 Defense White Paper states that China's "overall national strength has considerably increased." It supports Hu's call for naval development, stating that China's navy "aims at gradual extension of the strategic depth for offshore defensive operations and enhancing its capabilities in integrated maritime operations and nuclear counterattacks." The White Paper further declares that China's

> Navy is working to build itself into a modern maritime force. . . consisting of combined arms with both nuclear and conventional means of operations. Taking informationization as the goal and strategic focus in its modernization drive, the Navy gives high priority to the development of maritime information systems, and new-generation weaponry

> and equipment. Efforts are being made to improve maritime battlefield capabilities, with emphasis on the construction of relevant facilities for new equipment and the development of combat support capabilities. The Navy is endeavoring to build mobile maritime troops capable of conducting operations under conditions of informationization, and strengthen its overall capabilities of operations in coastal waters, joint operations and integrated maritime support. Efforts are being made to improve and reform training programs and methods to intensify training in joint integrated maritime operations. The Navy is enhancing research into the theory of naval operations and exploring the strategy and tactics of maritime people's war under modern conditions.[16]

DoD Report Summary

The U.S. Department of Defense's 2006 annual report to Congress on the *Military Power of the People's Republic of China* raises concerns about Beijing's lack of transparency concerning the purposes and future dimensions of PLA development. It further states that

> Securing adequate supplies of resources and materials has become a major driver of Chinese foreign policy. . . .China has also strengthened ties to countries that are located astride key maritime transit routes (e.g., the Straits of Malacca). PRC strategists have discussed the vulnerability of China's access to international waterways. . . .China is investing in maritime surface and sub-surface weapons systems that could serve as the basis for a force capable of power projection to secure vital sea lines of communication and/or key geostrategic terrain.[17]

The marked disparity between these Chinese and U.S. assessments of China's military modernization raises pressing questions concerning the extent to which China possesses and will seek to develop naval capabilities, particularly for scenarios beyond Taiwan—for instance, to secure the nation's substantial, rapidly growing seaborne energy imports.

Force Structure

Budget

Annual increases in China's official defense budget averaged 15 percent between 1990 and 2005.[18] China's official defense budget has expanded fourfold in inflation-adjusted terms since 1997.[19] Expenditures on equipment (which includes procurement, and, to some extent, research and development) have quadrupled in inflation-adjusted terms, from $3.1 billion in 1997 to $12.3 billion in 2006.[20] The official 2006 budget of $35 billion represented a 12.6 percent increase over 2005 and a 100 percent increase over the 2000 figure. According to Jiang Enzhu, spokesman for the Fifth Session of China's Tenth National People's Congress, "China's defense budget for 2007 is expected to hit 350.921 billion yuan (44.94 billion U.S. dollars), 17.8 percent higher than that

last year. . . ."[21] Jiang justified Beijing's largest military spending raise since the 19.4 percent augmentation from 2002 by stating that "We must increase our military budget, as it is important to national security. China's military must modernize. Our overall defenses are weak."[22]

Regardless of exact budgetary figures, China is clearly developing and procuring the weapons and nurturing the manpower to modernize its military significantly. China's capabilities are clearly growing, but its naval intentions—at least beyond asserting control over its claimed territorial waters, to include Taiwan—remain somewhat unclear. In the absence of authoritative policy statements or specific figures, let us now examine China's naval platforms for more concrete indications of its maritime development trajectory.

China's Submarine Force: Underpinning the Emerging PLA Navy

The heart of China's accelerating naval development is its submarine force. Submarines offer the PLAN a weapon system that is at once a cost-effective deterrent and a highly lethal means of battling even a superior fleet of surface ships. Recently commanded by Admiral Zhang Dingfa, a nuclear submariner who was promoted to the Central Military Commission in 2004, the PLAN is poised to intensify its undersea-warfare capabilities.

The PLAN launched thirteen submarines between 2002 and 2004.[23] These vessels include two new classes of nuclear submarines, as well as the advanced *Song*-class diesel submarines and the *Yuan*-class diesel submarine, the latter of which, according to some reports, represented a surprise for U.S. intelligence.[24] As many as fourteen *Song*-class submarines have been launched thus far, in three progressively refined variants. The *Song* program defied Western predictions that the series would be a failure and that production would halt upon purchase of Russian platforms. The *Song* is designed to carry the potent YJ-82 ASCM (antiship cruise missile).[25]

Considered by experts to be either a "Kilo with Chinese characteristics" or a "*Song* with Russian characteristics," the Type 041 *Yuan*-class submarine could conceivably be equipped with revolutionary AIP (air-independent-propulsion) technology, which allows diesel submarines to operate underwater for far longer periods without surfacing to snorkel. Even if this is yet not the case, constant attention to AIP on the part of Chinese analysts suggests that such technology may be incorporated into future submarines.

By the end of 2006, the PLAN had also taken delivery of eight formidable *Kilo*-class Project 636M submarines purchased in 2002, complete with associated weaponry such as wake-homing and wire-guided torpedoes and the supersonic SS-N-27B ASCM.[26] The new acquisitions added to the two Project 877EKM and two Project 636 variants the navy already operates. Project 636M *Kilo*s are reported to have an endurance capability of 45 days, allowing for a range of

6,000 nautical miles at 7 kt (with snorkeling). Undersea weaponry is a major priority for the PLAN. Accordingly, the new submarines described above are equipped with a lethal mix of Russian and indigenous torpedoes and ASCMs. With wake-homing torpedoes, for instance, it takes much less skill to strike the target, as fire control is vastly simplified.

As more modern diesel submarines join the fleet, China's second generation of nuclear submarines is also making its debut.[27] Two Type 093 nuclear-propelled attack submarines (SSNs) were launched in 2002 and 2003 and may have begun sea trials in 2005 and 2006, with service entry dates in 2007 and 2008, respectively. A third hull, possibly of a more advanced design, is reportedly nearing completion.[28] *Jane's* predicts that three additional 093s will be built in the near future.[29] The 093 is thought to be replacing the five hulls (401 through 405) of China's first-generation Type 091 *Han*-class SSN. It is reported that the 093 may have been constructed in Huludao Shipyard with Russian assistance.

A single Type 094 nuclear-propelled ballistic-missile submarine (SSBN) was launched in 2004, and has been undergoing sea trials since early 2006. The platform reportedly became operational in mid-2007, and its ballistic missiles are expected to do so by 2008–9.[30] A second hull was reportedly launched in 2006 and may be commissioned in 2010. *Jane's* reports that two other hulls are probably under construction and that they may be launched in 2008 and 2010 and commissioned in 2012 and 2014, respectively. It is thought that the 094 might be outfitted with twelve forty-two-ton JL-2 (CSS-NX-5) SLBMs (submarine-launched ballistic missiles). The missiles boast an estimated maximum range of over 8,000 kilometers and a circular error probable of 300 meters. They can be armed with three to eight multiple, independently targeted warheads apiece and equipped with penetration aids. The 094 may be based on the 093's design and share many of its features, but it displaces 2,000 tons more than its cousin, at 8,000 tons.

Scott Bray, deputy senior intelligence officer for China in the U.S. Navy's ONI (Office of Naval Intelligence), states that "a fleet of probably five Type 094 SSBNs will be built in order to provide more redundancy and capacity for a near-continuous at-sea SSBN presence."[31] If operationally successful, the 094 would represent a substantial improvement over China's single first-generation Type 092 *Xia*-class SSBN, which was equipped with short-range (1,770 kilometers) JL-1 SLBMs, is rumored never to have made an extended patrol, and therefore is unlikely ever to have constituted an intercontinental nuclear deterrent.

The trajectory of China's nuclear propulsion program offers one of the best single indicators of whether China seeks to become a genuine global military power. With no need to surface to recharge batteries and no need to refuel—not to mention unparalleled survivability if acoustically advanced and properly operated—nuclear submarines remain ideal platforms for persistent operations in far-flung sea areas. They will form an efficient means for China to project

power should it choose to do so. ONI's Scott Bray states that while the 094 "will provide China with a modern and robust sea-based nuclear deterrent force," the 093 constitutes "an effort to improve the PLA(N)'s ability to conduct anti-surface warfare at greater ranges from the Chinese coast than its diesel submarine force offers."[32] A successful 093 program will significantly enlarge the geographic scope of Chinese submarine operations, perhaps ultimately serving as the cornerstone of a genuine blue-water navy. The 094 could take the survivability of China's nuclear deterrent to a new level, potentially enabling Beijing to posture more aggressively in times of crisis. The actual number of nuclear submarines China constructs and deploys thus will offer insight into its naval and nuclear strategies.

Chinese analysts acknowledge that America has long been dominant in undersea warfare, especially since the Cold War.[33] Many Westerners are therefore surprised that China would have the temerity to challenge the United States directly in this specialized domain of warfare. And yet PLAN analysts scrutinize U.S. Navy submarine build rates, which are currently below the replacement level, while carefully probing for potential USN submarine-force vulnerabilities.[34] A 2006 article by a senior PLAN strategist suggests that "China already exceeds [U.S. submarine production] five times over" and that the eighteen U.S. Navy submarines based in the Pacific would find themselves at a severe disadvantage against a fleet of seventy-five or more Chinese submarines.[35] While the author attributes these assessments to an American source, he makes no effort to dispute them.

Chinese Naval Mines: Undermining America's Littoral Presence in Asia?

Most evidence supports the idea that China does not seek to "rule the waves" writ large, at least for now. Rather, it is seeking the much narrower and more realizable objective of dominating the East Asian littoral. To help achieve this more limited objective, the PLAN has to date avoided acquiring costly aircraft carriers and is instead devoting considerable attention to a decidedly more mundane, less photogenic naval weapon: the sea mine.

Unlike their counterparts in most other navies, PLAN surface, subsurface, and air units regularly practice laying mines, as do civilian vessels. This suggests that sea mining is an important component of China's naval strategy. The PLAN is likely interested in sea mining in part because it is one of the less technology-dependent forms of asymmetric warfare—one that can be deployed to good effect today. Operational and informational asymmetries currently favor the use of PLAN sea mines. It is far easier to lay mines than to find and disarm them, particularly in Taiwan's shallow coastal waters. And America cannot expect Taiwan to defeat Chinese sea mines on its own. U.S. mine-countermeasures forces are located far from the fight, while the Taiwanese mine-hunting fleet is small and of uneven quality.

PLAN strategists contend that sea mines are "easy to lay and difficult to sweep; their concealment potential is strong; their destructive power is high; and the threat value is long-lasting."[36] Key objectives for a Chinese offensive mine strategy would be "blockading enemy bases, harbors and sea lanes; destroying enemy sea transport capabilities; attacking or restricting warship mobility; and crippling and exhausting enemy combat strength."[37] For future littoral warfare, it is said that "sea mines constitute the main threat to every navy, and especially for carrier battle groups and submarines."[38] Moreover, this emphasis corresponds to the PLAN evaluation that "relative to other combat mission areas, [the U.S. Navy's] mine warfare capabilities are extremely weak."[39]

China is apparently engaged in a significant effort to upgrade its MIW prowess. MIW capabilities are easily hidden and thus constitute a true "assassin's mace" for the PLAN, to borrow a term some Chinese sources explicitly use to describe this mode of combat.[40] China has amassed a large inventory of naval mines, many of which are obsolete but still deadly, along with somewhat more limited numbers of sophisticated modern mines, some of which are optimized to destroy enemy submarines. China's mine inventory thus not only is extensive but also likely contains some of the world's most lethal MIW systems. A recent Chinese article claims the PLAN possesses over 50,000 mines, consisting of "over 30 varieties of contact, magnetic, acoustic, water pressure and mixed reaction sea mines, remote control sea mines, rocket-rising and mobile mines. . . ."[41] China is on the cutting edge of MIW technological and concept development and already fields some systems absent from the arsenals of advanced nations such as the United States. PLA strategists, moreover, understand the human dimension of modern warfare. Chinese MIW doctrine appears to emphasize speed, psychology, obfuscation, a mix of old and new technologies, and a variety of deployment methods. It targets very specific U.S. Navy platforms and doctrines. And Chinese naval periodicals reveal an impressive MIW training regimen that goes well beyond rote, scripted exercises.

China would likely rely heavily on offensive mining in any Taiwan scenario. If the PLAN were able to employ these mines (an increasingly likely possibility), it would greatly hinder operations, for an extended time, in waters where the mines were thought to have been laid. The obvious means of employing mines is through submarines and surface ships, while the use of civilian assets should not be discounted. But there are growing signs that China recognizes the fact that aircraft offer the best means of quickly laying mines in significant quantity. These aircraft would be useless, however, without air superiority. China's increasingly impressive conventional ballistic-missile force and inventory of SAMs (surface-to-air missiles) and advanced tactical aircraft cast real doubt on the ability of the Taiwanese military to maintain air superiority over both the Taiwan Strait and the island itself. Relying heavily on sea mines, the PLAN may already be fully capable of blockading Taiwan, and even of obstructing crucial SLOCs

(sea lines of communication) in the western Pacific area. Indeed, sea mines, used to complement a variety of other capabilities, constitute a deadly challenge to U.S. naval power in East Asia.

Problems in China's defense–industrial complex—which is already showing strong evidence of improvement—will not constrain sea-mine deployment. What China cannot develop indigenously in the near term, it can procure from Russia. Whatever their origin, a significant Chinese buildup of these armaments could conceivably alter the cross-strait military balance in favor of the mainland.

Surface Ships: Gradually Projecting Power

Chinese maritime ambitions are not limited to wielding stealthy submarines, or even sea mines. "While China's submarine force is well suited to interdiction," explains ONI's Scott Bray, "protection of SLOCs with a submarine force is more challenging. To effectively protect shipping, a visible and demonstrable naval capability, generally based on surface combatants with the endurance and range to operate farther from shore for an extended period of time, is preferable."[42] The PLA Navy has recognized its overall weakness in air defense and surface warfare, and has taken impressive steps to overcome those problems. China has produced a new array of frigates and destroyers over the past five years that incorporate numerous advanced design concepts such as stealthy superstructures, vertical-launch air-defense systems (in four of six new destroyers), long-range ASCMs, and phased-array radars. China's three most recent classes of surface combatants all have sophisticated air-search and missile-guidance radars, and also are said to have the advanced, long-range SAMs to afford these ships a respectable area air-defense capability.

China is rapidly upgrading its previously backward destroyer fleet. The PLAN currently possesses sixteen Type 051 *Luda*-class missile destroyers. Built between 1970 and 1991, these relatively old vessels were designed for surface warfare, with limited antiair-warfare and ASW (antisubmarine-warfare) capability. They were refitted in the 1990s to improve their anti-surface-warfare and air-defense capabilities. A single Type 051B *Luhai*-class multi-role missile destroyer, *Shenzhen* (hull 167), entered service in 1998 and was refitted in 2004. Two Type 051C *Luzhou*-class air-defense guided-missile destroyers have been built so far. Based on the older Type 051B hull design, *Shenyang* (hull 115) and *Shijiazhuang* (hull 116) are outfitted with the long-range Russian SA-N-20 SAM system.[43] Two hulls of the Type 052 *Luhu*-class multi-role missile destroyer (*Harbin,* hull 112, and *Qingdao,* hull 113) entered service in the mid-1990s. These were the first Chinese surface combatants equipped with comprehensive surface-strike, air-defense, and ASW capabilities, and also the first Chinese-built warships to be fitted with significant suites of sophisticated Western-designed weapon systems and sensors.

At 154 meters long and displacing 6,500 tons, the two Type 052B *Luyang I*-class multi-role missile destroyers commissioned in 2004 are larger than any destroyers that China has previously built. New indigenous and imported weapon and sensor systems give *Guangzhou* (hull 168) and *Wuhan* (hull 169) enhanced air-defense capability, as well as basic ASW capability. The PLAN's two Type 052C *Luyang II*-class air-defense guided-missile destroyers are based on the Type 052B hull. *Lanzhou* (hull 170), commissioned in 2004, and *Haikou* (hull 171), commissioned the following year, both possess the indigenously produced, vertically launched HHQ-9 SAM system and the phased-array Sea Eagle radar, which resembles U.S. SPY-1 phased-array radars. This last suggests that China may have mastered a potent air- and missile-defense technology that eluded Soviet technicians.

Two Project 956 *Sovremenny*-class missile destroyers, purchased from Russia in 1996 and delivered in 1999 and 2000, are now designated *Hangzhou* (hull 136) and *Fuzhou* (hull 137). Two improved Project 956EM variant vessels (hulls 138 and 139) with enhanced ASCMs, wide-area air-defense systems, and sensors have also been delivered. "The long-range [SA-20] SAM systems [that the *Luzhou* and *Luyang II* destroyers] possess will provide Chinese surface combatants with an area air defense capability as they operate farther from shore and outside of the protection of land-based air defense assets," ONI's Scott Bray extrapolates.

> Under the protection afforded by these advanced area air defense destroyers, which are also equipped with long-range ASCMs, the Chinese Navy can operate combatants such as two recently acquired *Sovremenny* II [destroyers]. These long-range engagement and air defense capabilities now being fielded by the PLA(N) give China a significantly improved capacity for operations beyond the littoral in support of SLOC protection.[44]

China's inventory of frigates has likewise improved substantially in recent years. Starting in the 1990s, China's thirty-two relatively obsolete Type 053 *Jianghu*-class missile frigates have been supplemented by twelve Type 053H2G and 053H3 *Jiangwei*-class multi-role missile frigates. Of these, the last eight vessels of the Type 053H3 (*Jiangwei II* class) possess improved weapon systems and sensors. In 2005, the PLAN took delivery of two new-generation, *Jiangkai*-class Type 054 multi-role frigates, *Ma'anshan* (hull 525) and *Wenzhou* (hull 526). These vessels boast French-made diesel engines and a combination of Russian- and Chinese-made weapon systems, including vertical launch cells and phased-array radars. In early 2007, according to Internet photos, up to four *Jiangkai II*s were being built at two different shipyards, Guangzhou and Shanghai's Hudong. This is the first class of surface warship of which China has built more than two since the 1990s.

China's surface fleet also includes the stealthy *Houbei*-class Type 2208 fast-attack missile craft. Since 2004, several Chinese shipyards have delivered at least

four hulls of this high-speed (perhaps 45 knots), wave-piercing catamaran, which boasts several features intended to help it evade detection. Internet photos indicate that additional hulls are being produced in rapid succession. According to Internet sources, as many as six shipyards are now producing the Type 2208, suggesting that it, along with the submarine force, may become a key component of the new PLAN. The mission of these craft would presumably be to destroy Taiwan's surface force quickly in wartime, if indeed that fleet made it out of port. This impressive anti-surface weapon system would be highly effective in attacking surface warships in the waters around China, although the Type 2208's limited endurance would prevent it from operating far from the Chinese coast for extended periods. If 2208s could carry eight ASCMs each, they would have significant firepower, but they are formidable even with their current armament of four ASCMs. The 2208's minimal in-water profile and high speed, moreover, make it a difficult target for torpedoes.

Amphibious Forces

China has made significant progress in amphibious warfare, probably because of its perceived relevance to a Taiwan contingency: "Overall strength is continuously increasing," declares one Chinese commentator, "and already in the near term the number of forces required for combat victory will be attained . . . for large-scale amphibious operations."[45] Emphasizing this strategic linkage, the Pentagon's 2006 report on Chinese military power states, "PLA amphibious exercises and training in 2005 focused on Taiwan. In September 2005 the PLA held one large-scale, multi-service exercise that dealt explicitly with a Taiwan invasion. China has conducted 11 amphibious exercises featuring a Taiwan scenario in the past 6 years."[46]

The PLAN currently possesses at least fifty medium and heavy amphibious lift vessels.[47] China has constructed nine 4,800-ton *Yuting III* landing ships tank, or LSTs, since 2003, building on significant amphibious construction efforts from the previous decade. Type 63C amphibious armored personnel carriers, operating in concert with several hundred Type 63A amphibious tanks boasting 105-millimeter guns and gun-launched missiles, give the PLA a useful new capability. Meanwhile, the PLAN is building LSMs (landing ships medium), as well as—evidently—its first amphibious landing dock (LPD)-type amphibious assault ship, which is thought to be equipped with transport hovercraft modeled on U.S. landing craft air cushion, or LCACs.[48]

In 2004, a photo of a model of a possible Chinese LPD appeared on the Internet. In the fall of 2006, additional photos became available, showing the transport being built in a large graving dock at Shanghai's Hudong Shipyard. The "Type 071" LPD (as it has been called unofficially) was launched on December 21, 2006, and is currently being fitted out. Richard Fisher describes

the Type 071 as "the PLAN's largest indigenously designed combat ship to date."[49]

PLANAF

The PLAAF (PLA Air Force) and PLANAF (PLAN Air Force), which are finally beginning to recover from grave setbacks suffered during Mao's Cultural Revolution, currently possess 2,300 operational combat aircraft. Of these, over 700 are capable of conducting operations against Taiwan without aerial refueling.[50] China still relies on massive imports of Russian planes and their components, particularly tankers and jet engines. The PLAAF uses one hundred twenty H-6 (B-6) twin-engine, medium-range bombers, derivatives of Russia's Tupolev Tu-16/Badger, as its medium- to long-range strategic and tactical air-strike platform, and continues to produce slightly improved versions of this aircraft.[51] The PLANAF uses an H-6 variant for antiship missile attack. Other H-6 variants serve as aerial refueling tankers. These will be supplemented by eight Ilyushin Il-78M four-engine tankers ordered in September 2005,[52] the deployment of which "will extend the range and strike potential of China's bomber and fighter aircraft."[53] Some H-6s also conduct reconnaissance and collect electronic signals intelligence (ELINT).[54]

China is finally beginning to achieve comprehensive domestic production capacity, even as it acquires advanced Russian platforms. A 2006 *Jane's* report concludes, "Since the end of the Cold War, there have been more research and development activities into fighter aircraft in China than anywhere else in the world. There are now at least 16 active purchase, co-production, production or development programmes for combat aircraft and combat helicopters in China."[55] A second *Jane's* report explains that China's "aviation sector is showing the fruits of massive investment," particularly in skilled personnel and cutting-edge production facilities, as well as machine and development tools.[56] The growing stable of modern aircraft resulting from these efforts, along with the increasingly potent weapons these aircraft carry, is increasing China's chances of achieving air superiority over the Taiwan Strait and even the island itself. While coordination between the PLANAF and the PLAAF has long been problematic and subject to speculation, it seems that some of these recent equipment upgrades, coupled with improved training and doctrine, will increase the possibility of effective joint operations in the future, particularly operations against aircraft carriers venturing into East Asian waters.[57] Were the European Union to lift its 1989 Tiananmen arms embargo, China could further step up its progress in these areas.

The PLA accepted shipments of twenty-six Su-27s in 1992, twenty-two in 1996, and twenty-eight in 2002. It has manufactured an additional one hundred of these aircraft indigenously, dubbing them the J-11. The J-11 has served as a

test bed for China's indigenous WS-10A turbofan engine, and perhaps for the associated, indigenously built radar and fire control systems and the PL-12 active-guided AAM (air-to-air missile).[58] Ten two-seat, twin-engine Su-30 multi-role fighter aircraft, currently the most capable in the Chinese inventory, were received in 2000, followed by twenty-eight in 2001, thirty-eight in 2003, and twenty-four in 2004, for a total of one hundred Su-30s to date. China's improved Su-30MK2 variant, which boasts an antiship strike capability and an improved electronic-warfare and electronic-countermeasures suite, was developed specifically for naval aviation. An improved engine and new radar have been installed in the Su-30MK3 variant, over and above the improvements to the Su-30MK2. *Jane's* maintains that these latter Su-30 variants offer the PLA "world-class all-weather strike" capabilities for the first time,[59] and forecasts that all China's Su-30s will ultimately be upgraded to the MK2 standard.[60] Thus, China arguably had 266 fourth-generation aircraft in its arsenal by 2004.[61] As many as twenty of China's JH-7 two-seat, twin-engine JH-7 fighter-bomber aircraft, also designated FB-7 or FBC-1 Flying Leopard, are in the PLANAF inventory. Introduced in 2004, the improved, formal production variant dubbed JH-7A is assessed as having achieved the overall performance level of Western fighters deployed from the 1960s through the 1980s.[62]

China's new, indigenous fourth-generation J-10 multi-role fighter is now in serial production and in service with PLAAF units. J-10s have demonstrated their in-air refueling capability through publicly documented exercises. The J-10 is thought to be based on Israel's discontinued Lavi (which itself exploited U.S. F-16 technology) and to approach the performance parameters of Washington's F-16 Fighting Falcon and Brussels's Eurofighter,[63] including a radar detection range of 125 kilometers and the ability to fire active-guided PL-12 AAMs and deliver PGMs (precision-guided munitions).[64] In a sign that Beijing considers the J-10 a breakthrough, the official news agency Xinhua has publicly recognized its designers. This follows eighteen years of secretive effort as a "national key project involving more than 100 research units, more than 20 ministries, commissions and sectors."[65] In a development of potentially revolutionary significance, an indigenous LM WS-10A Tai Hang turbofan engine may be substituted for the Russian AL-31F that currently propels the J-10.[66] China is already in the process of developing further advanced aircraft, including perhaps even a "fifth generation 'stealth' fighter" that some have dubbed the "J-14."[67] China has purchased a variety of Russian PGMs to equip its aircraft, including the Kh-29 antiship missile (10 kilometer range), the Kh-31P anti-radiation missile (110–200 kilometer range), the Kh-59ME antiship missile (115 kilometer range), and the KAB-1500 laser-guided munition.[68]

To bolster the effectiveness of Chinese air power, the PLA is attempting to improve its airborne ISR (intelligence, surveillance, and reconnaissance) capabilities. China is currently developing two major indigenous platforms, improving

on previous efforts that derived from modified Ilyushin Il-76 and Tupolev Tu-154 variants.[69] It purchased A-50 AWACS (airborne warning and control system) aircraft from Russia after the United States pressured Israel into canceling a sale of Phalcon AWACS aircraft to Beijing in 2000.[70] China has reportedly been developing the indigenous KJ-2000 AWACS aircraft to conduct surveillance, perform long-range air patrols, and thereby coordinate naval air operations.[71] China's smaller KJ-200/Y-8 "Balance Beam" AEW (airborne early-warning) maritime patrol/electronic-warfare aircraft, with its electronically steered phased-array radar, is said to complement the KJ-2000 by performing tactical AEW and ELINT more economically.[72] Derived from Russia's Antonov An-12/Cub transport and produced under license by Shaanxi Aircraft Industry (Group) Corporation, China's more than one hundred Y-8s are divided among over twenty variants that perform such additional missions as radar testing, airlift support, and helicopter and UAV (unmanned-aerial-vehicle) transport. Various sources report that a KJ-200 aircraft crashed on June 4, 2006, killing forty people and possibly retarding the program.[73] If successfully developed, however, these platforms could give China an important aerial battle-management capacity.

Helicopters have traditionally been an area of weakness for the PLA. Most platforms in its disproportionately small fleet (roughly three hundred in the PLA, forty in the PLAN) are either imports or copies of foreign models. The PLANAF operates ten to twelve Z-8s, a derivative of France's Aerospatiale SA 321Ja/Super Frelon. A Z-8F variant powered by Pratt & Whitney engines first flew in 2004. The PLAN also operates a naval version (-C) of the PLA's more than two hundred Zhi-9/Haitun (Z-9) multi-role army support helicopters, which are licensed copies of France's Eurocopter AS 365N/Dauphin II. The PLAN also operates ten to twenty Kamov Ka-28/Helix naval helicopters purchased from Russia to operate from its *Sovremenny* destroyers, as well as perhaps from its Type 052B and Type 052C destroyers. The Ka-28's VGS-3 submarine-detecting dipping sonar and sonobuoys, complemented by any new improvements in rotary-wing aviation, will help the PLAN address one aspect of its significant weakness in ASW. China is attempting to further remedy its helicopter deficiency by developing joint ventures with foreign manufacturers such as Eurocopter. Reportedly, CHRDI (China Helicopter Research and Development Institute) is developing an indigenous WZ-10 advanced attack helicopter,[74] with possible army and transport variants.[75]

Having observed the U.S. military's extensive use of UAVs in recent years, China is purchasing foreign models, transforming former piloted aircraft into UAVs, and developing indigenous variants.[76] China's unmanned combat aerial vehicles include J5/7 remotely controlled ground-attack fighter drones and one hundred Harpy antiradar drones obtained from Israel in 2001.[77] China may have reverse-engineered and indigenously produced additional Harpys. These small, stealthy, autonomous flying bombs could destroy Taiwanese air-defense radars.

China's reconnaissance UAVs include Guizhou Aircraft Industry Corporation's new-generation WZ-9 (WZ-2000); BUAA's (Beijing University of Aeronautics & Astronautics) WZ-5 and WZ-5A variants (modeled on the U.S. AQM-34N Firebee); BUAA's VT-UAV vertical take-off/landing UAV; and the ASN-15, -104, -105, and -206 tactical reconnaissance UAVs. While visually similar to General Atomics's Predator, the turbojet-driven WZ-2000 (a prototype of which is reportedly being tested) apparently has "far less endurance."[78] Guizhou is also developing a medium-endurance UAV.[79] The ASN series, developed by Xi'an Northwest Polytechnic University ASN Technology Group Company, includes the short-range multi-role ASN-206, which is capable of conducting ISR operations, electronic-warfare operations, and electronic-countermeasures operations, reportedly making it "one of the most popular and advanced tactical UAV systems fielded by the PLA." Chinese target drones include the TianJian-1 cruise-missile simulation version (which reportedly entered service in 2005); Shaanxi's Chang Kong-1, -1A, -1B, -1C, and -1E versions (of the Soviet Lavochkin La-17C radio-controlled subsonic target drone); and the Ba-2, -7, and -9 (ASN-2, -7, and -9) radio planes. The Ba-9, developed by Xi'an, "was designed for the training of navy antiaircraft artillery (AAA) crews on surface ships."

C4ISR

No overall assessment of China's naval development is complete without consideration of the increasingly important aerospace dimension. Any increase in Chinese naval capability, from access denial to blue-water operations to power projection, will hinge in part on aerospace innovations, from air- and space-based platforms to C4ISR capabilities. By the end of the Cold War, despite major imbalances in this area, China had become the first developing country to achieve comprehensive aerospace capabilities. While China still confronts some challenges, particularly in its aviation sector, it appears to be making rapid, comprehensive progress in producing advanced aerospace platforms. This in turn affords China an increasing range of military operational possibilities.

Beijing has the world's premier sub-strategic mobile missile force. China has positioned 710–90 mobile DF-11 (300 kilometer range) and DF-15 (600 kilometer range) SRBMs (short-range ballistic missiles) in coastal areas opposite Taiwan, constituting an arsenal that "continues to expand at an average rate of about 100 missiles per year."[80] Increasingly capable, accurate, and numerous, PLA SRBMs offer decapitation strike and PGM capability that does not require operationally more-complex manned aircraft. If sufficiently accurate and employed in sufficient numbers, they can render Taiwan's airfields inoperable. SRBMs can also destroy infrastructure nodes, severely disrupting Taiwan's ability to transmit electricity, refine petroleum, and otherwise support its economy and military.

China is fielding a number of new strategic nuclear systems. An upgraded version of China's DF-5 liquid-fueled ICBM (intercontinental ballistic missile) may have a range of up to 13,000 kilometers and may be equipped with multiple, independently targeted warheads.[81] Based on the JL-1 SLBM, road-mobile, and fueled by solid propellant, China's DF-21 boasts a range of 2,500 kilometers and has a variant with improved accuracy.[82] China's DF-31 ICBM (range of 7,250 kilometers) and its DF-31A variant (11,270 kilometer range) are also solid-fueled and road-mobile,[83] making them extremely difficult to target—as would be any JL-2 SLBMs (apparently derived from the DF-31, with a range of 8,000 kilometers) based in Type 094 SSBNs at sea. This combination may finally give Chinese leaders confidence that their nuclear forces are survivable and thus capable of providing a credible second-strike capability. This could significantly alter crisis calculations and stability on both sides of the Pacific.

China may already be developing the capability to target U.S. ships with ballistic missiles such as the DF-21, with its 500–600 kg warhead.[84] "China is equipping theater ballistic missiles with maneuvering reentry vehicles (MaRVs) with radar or IR seekers to provide the accuracy necessary to attack a ship at sea," states ONI's Scott Bray.[85] If supplied with accurate real-time target data, perhaps China's growing family of radar reconnaissance and electro-optical surveillance satellites, terminal radar seekers, and maneuvering warheads could enable Chinese ballistic missiles to complicate or negate U.S. ballistic-missile defense efforts and seriously threaten their targets.[86] If they work, they would be extraordinarily difficult to defend against.

China has acquired hundreds of high-speed track-via-missile-guided S-300 (SA-10) SAMs from Russia. S-300s are capable of covering the Taiwan Strait from their launchers on the Chinese mainland. Beijing may purchase the S-400 (SA-20) system (with a range of up to 400 kilometers) as well.[87] By 2004, according to *Jane's,* China had received twelve battalions (as many as 144 launchers and 576 missiles) of S-300 PMU and S-300 PMU-1 SAMs, the latter which has a range of 105 kilometers. The PLA is reportedly planning to acquire four to eight battalions of S-300 PMU-2 SAMs (240 launchers, 960 SAMs, range of 150–200 kilometers). An initial battalion may have been delivered in 2006.[88] The HQ-9, an indigenous SAM based on S-300 and Patriot missile technologies, is deployed aboard the PLAN's Type 052C *Luyang II*-class guided-missile destroyers. Deployed on Type 051C *Luzhou*-class guided-missile destroyers and controlled by Tombstone phased-array radars, the Russian SA-N-20 SAM "more than doubles the range of current PLAN systems."[89] Moreover, China's first generation of land-attack cruise missiles (LACMs, such as the Yingji-63, with a range of 400–500 kilometers) will reportedly soon become operational, exponentially increasing PRC power-projection capabilities.[90] The Donghai-10, a second-generation LACM with a range of over 1,500 kilometers, has apparently been test-fired.[91]

The combination of range and lethality offered by these missiles has tremendous ramifications for any battle for air superiority over Taiwan.

But China has achieved perhaps its most striking progress in antiship missiles, where the full-spectrum indigenous capabilities it has achieved approach world-class status in many respects. This offers increasingly effective means not only to strike at U.S. carrier strike groups but also to support future missile development financed by robust international commercial sales (and co-development; e.g., with Iran).[92] Every surface warship launched by China in the past decade (with the possible exception of the new LPD) carries long-range, lethal, indigenously developed Yingji-series ASCMs. The C-801 (YJ-8)/802 (YJ-83) series of missiles currently forms the backbone of China's ASCM inventory. Strongly resembling France's MM38/MM39 Exocet, the C-801 is used by the PLANAF's JH-7 fighter and the PLAN's *Song* submarine. A single Chinese-made C-802, which is less capable than China's newer ASCMs, disabled an Israeli *Hanit Sa'ar 5*-class missile boat off Lebanon in 2006, killing four sailors. The C-802 has undergone improvement through a series of variants. Fitted on the PLAN's Type 052C *Lanzhou*-class destroyers, the sea-skimming C-602 (YJ-62) rapidly descends to 7–10 meters above sea level (in waters up to sea state 6), delivering its 300 kg armor-piercing high-explosive warhead at Mach 0.6–0.8, assisted by inertial navigation and GPS. China also has the SS-N-27 Klub supersonic ASCM, which it can launch from its newest eight *Kilo* submarines.

Russia has also been contributing to China's already impressive indigenous missile inventory by selling China weapons for which there is no Western equivalent. China's four *Sovremenny*-class destroyers boast supersonic Raduga 3M80 "Moskit" (SS-N-22 "Sunburn") ramjet-powered ASCMs, which boast a range of at least 120 kilometers, a velocity over Mach 2, and the ability to execute terminal homing maneuvers that seriously complicate a defender's fire-control solution. The PLAN has fired this formidable missile from its four *Sovremenny*-class destroyers. Hulls 138 and 139 may be equipped with a 250 kilometer-range variant of the Moskit.[93] China has also reportedly acquired both variants of Russia's supersonic (greater than Mach 2) Zvezda-Strela Kh-31 (AS-17 "Krypton") sea-skimming missile, which is powered by a ramjet and has a range of 200 kilometers. Kh-31s are being manufactured indigenously as the YJ-91 or YJ-93.[94] The PLAN's Sukhoi Su-30MK2 "Flanker" fighters, as well as perhaps its JH-7As, are reportedly fitted with the Kh-31. Russia specifically designed the Kh-31P passive high-speed anti-radiation (as opposed to Kh-31A active radar) version to assault Western radar systems such as the U.S. Navy's SPY-1. Finally, even Russia itself does not field the Kh-59MK antiship missile it helped develop for the PLAN's Su-30MK2 fighters. This radar-guided, data-linked missile has a range of 250–300 kilometers.[95]

While China's missiles have long been identified as a potential threat to U.S. forces, perhaps some of China's greatest recent progress has occurred in space.

China produces increasingly sophisticated microsatellites weighing 10–100 kg, far less than the average satellite. They potentially permit China to deploy satellite constellations, decreasing costs while increasing reliability, particularly in communications (as opposed to reconnaissance) missions. Should these space-based assets come under threat, the larger numbers in which they could be deployed would make them harder to target and easier to replenish. At 25 kg, furthermore, the Naxing-1 microsatellite made China the fourth country, after Russia, the United States, and the United Kingdom, to launch a satellite approaching nanosatellite designation (i.e., weighing 10 kg or less).[96] China's other satellites have been similarly impressive. Launched in May 2002, the Haiyang-1A ended China's sole reliance on foreign satellites for maritime observation. This marine remote sensing satellite, which monitors China's peripheral seas, was the prototype for a series of Chinese maritime monitoring satellites.[97] According to an official publication, 12 percent of Haiyang-1A's 2003 "satellite data distribution" was "military."[98] A follow-on satellite, Haiyang-1B, with double its predecessor's data capacity, was reportedly launched in April 2007.[99] According to Sun Zhihui, director of China's State Oceanic Administration, China's State Council has approved the development of a series of Haiyang-Bs.[100] In 2001, RAND reported that China had "developed remote sensing satellites capable of transmitting images of the earth's surface in near-real time."[101] Such a capability could greatly improve China's ability to monitor force deployments on its periphery.

In a development that mirrors Western efforts to reduce costs and enhance reliability, satellite buses (standardized platforms) constitute the backbone of China's microsatellite efforts. China is developing at least five variants of three major small satellite buses: CAST968A, B, and C;[102] CAST2000;[103] and CASTMINI (for true microsatellites). CAST968's design characteristics reportedly include a very high subsystem integration rate, good performance, and high efficiency. CAST968 has substantially improved small-satellite development time, cost, and quality. Total development time has been reduced to two years, approaching world standards.[104]

Satellite navigation has revolutionized military operations in every sphere of combat. Chinese missiles may use the U.S. GPS system, as well as Russia's GLONASS system, for navigation. China is also developing its own Beidou geostationary satellite navigation system in order to minimize its reliance on foreign systems. Beidou 1A, launched on October 30, 2000, was stationed over New Guinea. On December 20, 2000, Beidou 1B was placed over the Indian Ocean. Beidou 2A, launched on May 24, 2003, was placed in an intermediary position.[105] China launched a fourth (backup) satellite on February 3, 2007[106] and plans to launch a fifth satellite later in 2007.[107] China has already begun to employ Beidou extensively for both civilian and military applications.[108]

Beijing previously sought substantial access to Europe's nascent Galileo system,[109] which Chinese analysts have scrutinized.[110] While Europe reportedly never planned to give Beijing access to the military component of the system, there was concern that China might be able to penetrate Galileo's PRS (Public Regulated Service) receivers.[111] Due both to such security concerns and to Galileo's importance as a strategic pan-European asset, the Galileo Joint Undertaking (in which China invested $6.5 million as a shareholder, and through which China had agreed to invest an additional $260 million) will be replaced in 2007 by the Galileo Supervisory Authority, in which ownership is solely European. Sino-European disagreement concerning Beijing's access to Galileo has apparently intensified existing Chinese efforts to develop Beidou. Indeed, there are reports that China seeks to purchase hydrogen master atomic clocks—the keystone of an effective satellite navigation system—from Galileo's supplier, Switzerland's Neuchatel Time.[112] While Beidou previously appeared to be rudimentary and perhaps subordinate to Galileo, the launch of additional satellites will increase the system's military applications.[113]

China's official media reports that Beidou will be developed into a full, independent navigation satellite constellation called Compass. Designed to cover China and surrounding regions by 2008, Compass would ultimately use five satellites in geostationary earth orbit and thirty in medium earth orbit to provide global coverage.[114] Compass's commercial Open Service would offer "positioning accuracy within 10 meters, velocity accuracy within 0.2 meter per second and timing accuracy within 50 nanoseconds,"[115] while an even more accurate signal, coupled with system status updates, would reportedly be available to the PLA. There is concern that the radio frequencies used by Compass will overlay both Galileo's PRS and possibly GPS's M-Code, thereby complicating adversary attempts to jam Compass in times of conflict. Improvements in access to foreign and domestic positioning systems increase the accuracy of Chinese missiles and other position-dependent equipment. Development of Compass as a viable independent system could improve Chinese access to reliable signals in conflict.

China's aerospace development has profound implications for the U.S. military. Chinese strategists envision aerospace assets playing a vital role in any future Taiwan scenario. For instance, ballistic and cruise missiles guided by Beidou satellites might be used to target U.S. aircraft carriers. The most fundamental question is whether the PLA will be able to master the developments in air- and space-based platforms and C4ISR needed to support a PLA strategy beyond the East Asian littoral. Such a strategic requirement would necessitate the continued transformation of the PLA, as at present China's current submarine-focused navy and its still-limited air force can only support the more modest strategy of access denial. But just as China was not dissuaded from submarine development in the recent past by American dominance in that area, Beijing also seems unwilling to acquiesce in U.S. aerospace dominance. As China's overall national power

continues to rise, its aerospace capacities are likely to rise with it, with significant implications for Beijing's ability to influence its maritime periphery and challenge U.S. hegemony.

Chinese Deck Aviation Ambitions

The most comprehensive and far-reaching question concerning PLAN modernization is the extent to which Beijing will choose between a navy focused on large-deck aviation vs. one based fundamentally on submarines. This is because the former force structure would likely be needed for the PLAN to truly project power into the blue water "beyond Taiwan." According to Huang Qiang, head of the State Commission of Science, Technology, and Industry for National Defense, "China has the capability of building an aircraft carrier, but it is still unknown when one will be built."[116] Another media source of uncertain reliability states, "China could build its first aircraft carrier by 2010 if current research and development proceeds smoothly."[117] While critical datapoints remain unclear, aircraft carriers have already captured the imagination of China's public, and even of some of its strategists. Perhaps because of Beijing's determination to be respected universally as a great power and the nation's growing maritime interests, the PLAN is apparently contemplating various alternatives for developing aircraft carriers. Increasingly numerous and diverse statements and writings on this subject offer critical insights into Beijing's emerging maritime strategy.

To date, Beijing has made significantly greater progress in analyzing and targeting enemy carriers than in building its own. For instance, Taiwan scenarios and how to target U.S. surface combatants, especially aircraft carriers, are reportedly often discussed in PLA internal meetings.[118] As ONI's Scott Bray assesses, "Much of China's military modernization effort of the past five years, and particularly the modernization of the Chinese Navy, has been designed to improve China's anti-carrier capability. China envisions an attack on a carrier strike group as incorporating submarine-launched ASCM strikes and ASBM attacks."[119] Chinese recognition of the increasing vulnerability of carriers, particularly less-sophisticated versions such as China might develop, may thus retard Beijing's indigenous carrier development.

China has already purchased four decommissioned aircraft carriers, to considerable Western media speculation. China's old carriers, especially *Minsk* and *Kiev,* were probably purchased for dissection to inform future indigenous design efforts. *Varyag,* representing the largest and most advanced Soviet carrier design, may ultimately also be used for pilot and deck-crew training and as a "test platform" for general research and development of relevant shipboard systems. To this end, *Varyag* may be retrofitted with an engineering plant, shafts, and screws (which it was said not to have at time of sale to China), so that it can go to sea under its own power. Eventually, a modestly capable *Varyag* might

become a centerpiece of PLAN diplomacy, humanitarian operations, and disaster relief.

A small but determined collection of PLA leaders has advocated carrier development. Admiral Liu Huaqing championed the aircraft carrier when he became PLAN commander (1982–88), and subsequently as Central Military Commission vice chairman (1989–97). Whether it makes sense now for Beijing actually to develop an aircraft carrier has apparently been hotly debated in China. Song Xiaojun, editor in chief of *Naval & Merchant Ships,* reports that one PLA faction advocates aircraft-carrier development but must compete with elements urging submarine and aerospace industry development.[120]

A senior Chinese official has stated to the author that although he had "been an advocate of aircraft carriers for many years because we need them," until recently carriers had "not been the best use of national resources," because China "lacks an escort fleet," thereby making any carrier a vulnerable target. China has therefore invested instead in "submarines, mid-sized ships, and fighters [aircraft]." In 2004, this official declared to a group of Western academics that the reigning political and military consensus in Beijing held that the nation should not develop an aircraft carrier. In 2006, however, he stated that "China will have its own aircraft carrier" in "twelve to fifteen years." He explained this rapid shift by stating that over the past two years the subject of aircraft-carrier development had become a "heated internal debate" in Beijing. Chinese national interests had expanded, the security of SLOCs had increased in importance, the likelihood of noncombatant evacuation operations had grown, and Beijing had come to believe "air coverage" was essential to achieve "balanced naval forces."[121] Another indicator of Chinese interest in deck aviation appeared in a 2006 statement from Lieutenant General Wang Zhiyuan, deputy director of the PLA General Armament Department's Science and Technology Commission. Lieutenant General Wang declared that the PLA

> will conduct research and build aircraft carriers on its own, and develop its own carrier fleet. Aircraft carriers are a very important tool available to major powers when they want to protect their maritime rights and interests. As China is such a large country with such a long coastline and we want to protect our maritime interests, aircraft carriers are an absolute necessity.[122]

Ultimately the aircraft carrier itself is essentially a platform for air operations—the system of systems that allows for the projection of air power from the sea. The acquisition of such a vessel for the PLAN would thus be merely one benchmark, and a relatively simple one at that, along a complex continuum that might someday lead to a truly operational PLAN aircraft carrier. Subsequent steps would involve hardware, software, and training. Dramatic improvements in PLAN aerial power-projection capabilities hinge on breakthroughs in sea-based aviation, mid-air refueling, PLAN doctrine, ASW, and PLANAF service culture. Without major

improvements in ASW, for instance, any PLAN carrier would be an easy target for competently manned diesel-electric or nuclear-powered attack submarines. China appears to have made no significant progress toward correcting its weakness in ASW. Although its newer, large surface combatants can certainly carry helicopters and might carry ASW helicopters, none appear to have modern hull-mounted or towed-array sonars. There is also little evidence that China is devoting much effort to developing planes equivalent to the U.S. P-3 maritime patrol aircraft. Thus the PLAN's ASW capabilities, while perhaps slowly improving, cannot yet be counted on to provide a reasonable degree of security in open waters.

A PLAN carrier would play little role in a near-term Taiwan scenario, as land-based PLAAF and PLANAF aircraft could perform all required air operations across the narrow Taiwan Strait from airfields on the mainland. Unless China were able to produce a range of carriers and incorporate them into a cohesive and effective concept of operations, it is difficult to envision them as the centerpiece of PLAN doctrine in future decades. A senior Chinese official has further emphasized to the author that "China will not try to compete with the U.S. in the open sea. Even twenty PRC carriers cannot compete with U.S. nuclear carriers."[123]

For the foreseeable future, therefore, a Chinese carrier would most likely serve at least one of two major roles. The first would be to support secondary missions in which the most basic motivation is prestige. That aircraft carriers can play a unique role was demonstrated by the 2004 tsunami, after which the PLAN found itself completely upstaged by the U.S. Navy, the Indian Navy, and, most painfully, the JMSDF (Japan Maritime Self-Defense Force).[124] The second role for carriers would be to complement the PLAN's submarine-centered fleet. Missions allocated to carriers might include collective maritime security (e.g., SLOC protection and counter-piracy operations). This would obviously be a secondary PLAN mission, oriented toward friends and rivals in the SCS (South China Sea) and the Indian Ocean. Deployment of an aircraft carrier would also enable the PLAN to project force into the SCS on a modest scale, defending Chinese territorial claims there.

It remains to be seen, however, exactly what place aircraft-carrier development will have in what has been a prolonged, well-publicized, and increasingly successful attempt by China to become a maritime power.

Base Infrastructure

Adm. Wu Shengli, commander of the PLA, together with his coequal, Political Commissar Hu Yanlin, leads the 290,000 personnel (12.6 percent of the PLA's 2.3 million) serving in operational submarine, surface, naval-aviation, coastal-defense, and marine-corps units, as well as ten institutions imparting professional military education.[125] Personnel include 25,000 PLANAF members in seven

divisions with twenty-seven regiments;[126] 8,000–10,000 marines (whose number can reach 28,000 in wartime); and 28,000 coastal defenders.[127] The PLAN has 97,000 each of officers, noncommissioned officers, and conscripts, with the former being further divided into command, political, logistics, equipment, and technical career tracks.[128]

Like their headquarters, vessel types appear to be organized hierarchically (e.g., with nuclear-powered submarines enjoying higher status than their conventional counterparts).[129] China's North, East, and South Sea fleets each possess two submarine divisions, three destroyer/frigate divisions, and one mine-countermeasures division. Whereas the NSF (North Sea Fleet) has one amphibious division, however, the East and South Sea fleets each possess two. Recent efforts to make the PLAN a leaner, more effective fighting force include base realignment and closure; placement of PLAN forces under the direct command of their respective fleets; establishment of new "high-tech surface ship . . . units"; strengthening militia units and reserve units (particularly those involved in technological, logistical, and equipment support); engagement in "joint operation and systems building"; and consolidation of a "joint logistical support system." China's coastal defense force has also been strengthened and its equipment upgraded.[130]

China's NSF, headquartered at Qingdao (with the Naval Submarine Academy), has other major bases at Huludao (missile testing, R&D, training, and SSN/SSBN production), Jianggezhuang (SSBNs), and Lushun, as well as at Dalian (Naval Vessel Academy, other facilities) and Yantai (Aviation Engineering College). NSF PLANAF bases are located at Dalian, Qingdao, Jinxi, Jiyuan, Laiyang, Jiaoxian, Xingtai, Laishan, Anyang, Changzhi, Liangxiang, and Shanhaiguan.

Headquartered at Ningbo, China's ESF (East Sea Fleet) has other primary bases at Zhoushan, Shanghai, and Fujan. Located further inland are Nanjing's Naval Staff College and Wuhan's Naval Engineering University. PLANAF bases are located at Danyang, Daishan, Shanghai (Dachang), Ningbo, Luqiao, and Shitangqiao.

The SSF (South Sea Fleet), headquartered at Zhanjiang, with major bases in Yulin and Guangzhou (Naval Service Arms Command Academy), apparently contains several unique assets. A base to support China's new Type 093 and Type 094 submarines is now reportedly under construction on Hainan Island.[131] The SSF is also home to two marine infantry brigades at Heieu (the 1st and 164th). Each brigade includes one artillery regiment, one amphibious armor regiment, and three infantry regiments. The other fleets apparently lack such robust amphibious capabilities.[132] PLANAF bases are located at Foluo, Haikou, Lingshui, Sanya, Guiping, Jialaishi, and Lingling.

The PLAN also operates a variety of research institutes that provide input into its strategy. These include the Navy Research Institute in Beijing, the Command and Staff College in Nanjing, and the Naval Submarine Academy in Qingdao.[133]

Established in 1985, the Navy Research Institute is reportedly the PLAN's "single most important center . . . for the development of national-level naval strategy, the development of navy operational-level (campaign-level) warfighting concepts, naval tactics, and research and studies that look to the future of naval warfare and the development of foreign naval issues."[134]

Training

Chinese naval planners realize that rapidly improving equipment is useless without corresponding improvement in human performance.[135] This imperative appears to have been solidified in recent official directives, including a June 2006 General Staff Headquarters Plan,[136] and by a December 2006 PLA Comprehensive Military Training Conference that was reportedly attended by more than 150 military training experts.[137] Citing President Hu Jintao's mandate that military training be "raised to a new level through making innovations," a recent *People's Navy* article elaborates, "We should more intensively and extensively carry out battle training . . . in an authentic environment and in a complicated battlefield situation as a basic form of conducting campaign and tactical exercises so as to enhance the naval units' adaptability in sea battles under the condition of informatization."[138] A companion article stresses, "To ensure winning in wartime, the units should undergo difficult and rigorous training in peacetime according to the requirements of real war, and be tempered under various complicated and difficult conditions."[139] A survey of relevant articles in *People's Navy* suggests that exercises were scripted and rudimentary as recently as ten years ago. Over the past five years, however, they have become far more diverse and realistic.

Current PLAN-wide objectives include "training under real-war situations . . . employing mobile operations and support . . . operating in unfamiliar areas and under unknown conditions . . . training in poor weather conditions . . . conducting multiple training subjects simultaneously . . . employing increasingly larger formations . . . using data links and radio silence [and] operating in an electromagnetic jamming and countermeasures environment."[140] For instance, marine-corps training increasingly involves the use of simulators, and otherwise takes place in increasingly difficult conditions.[141] Shore-based logistics to support naval operations appears to have been substantially improved through computerized inventory management, maintenance and logistics interchangeability, and even outsourcing to the private sector through Internet ordering.[142] To better support an increasing number of operations in unknown areas, China is engaged in intensive surveying and mapping. The National Institute for South China Sea Studies, for instance, has produced China's first-generation "Digital South China Sea" chart. Extensively tested, it brings the PLAN's charts up to international standards and will support the voyages of Chinese vessels.[143]

Training advances will be further consolidated as increasingly well-educated, technologically sophisticated, and internationally aware personnel gain command in the PLAN, thanks to such programs as the ROTC-like National Defense Scholarship Program, curricular reforms, and study abroad.[144] As a *People's Navy* article emphasizes, "The Navy is a high-tech service with a complex variety of specialties. . . . So it is necessary to rely on science and technology and implement scientific management, scientific means, and scientific thinking in conducting training."[145] China's rapid economic, scientific, and technological development supports these improvements in human capacity, although it has simultaneously increased the need for material incentives to recruit talented individuals who enjoy attractive career options in the private sector. The PLAN's enlisted force, while recently reformed, remains dominated by rural males with limited education,[146] and demobilization can still undermine unit cohesion and expertise.[147]

Charged with seizing the initiative in unforeseen circumstances, *People's Navy* reports, PLAN officers are determined to improve the navy's capabilities,[148] to devise new training methods,[149] and to practice in more flexible sequences.[150] At the beginning of 2001, for instance, SSF Minesweeper 814 reformed its system for noncommissioned officers, implementing "training for different grades and levels," making training commensurate with previous experience, and thereby avoiding unnecessary repetition.[151] Minesweeper 852 introduced competition and exams to improve crew evaluations.[152] At the end of April 2005, a PLAN minesweeper unit practiced sweeping and laying mines in an "unfamiliar sea area," under all weather conditions, with the goal of "training as you will fight."[153] These examples stand in stark contrast to the rote, scripted, automaton-like training of only a few years ago.

To be sure, the PLAN is still working to meet its new goals. Malfunctions sometimes occur during exercises.[154] There is still some resistance to PLAN policies demanding that exercises mimic actual combat conditions.[155] And there is even evidence that the PLAN is still experiencing challenges as it makes the administrative transition to a modern professional organization. There is little doubt that the PLA realizes that joint operations constitute a critical element of limited, local warfare under high-technology conditions. The PLA has observed the U.S. armed forces closely, particularly in Operations Desert Storm, Desert Shield, and Iraqi Freedom, and recognizes the need to improve its joint capabilities. The question of how proficient the PLA is at joint warfare, however, is difficult to answer. There are some indications that PLA exercises are moving toward jointness, but it remains unclear how successful the PLA has been at actually accomplishing its goals.[156] To give a sense of the PLAN's latest efforts to address these problems, this chapter will now survey recent exercises in the PLAN's submarine, MIW, and air forces.

Submarine Force

While digital training and simulations can be useful, the only way to become proficient at handling submarines is to take them to sea and operate their weapons. Chinese submarine exercises have increased in sophistication in recent years and currently encompass such categories as command-and-control, navigation, electronic countermeasures, and weapons testing.[157] "Based on the revised [Outline of Military Training and Evaluation] issued in 2002," reports the U.S. ONI, "the PLAN is developing and implementing new and more realistic tactics and combat methods to enable its submarines to be able to attack, survive after an attack, and maintain the capability to attack again at a later time. . . ."[158] Crews strive to conduct a wider variety of increasingly lengthy and challenging exercises attuned to local environmental, hydrographic, and weather conditions.[159] PLAN submarines have gradually increased the amount of red-on-blue adversary training they conduct. In 2002, in the SCS, an "underwater vanguard boat" confronted ASW ships, aircraft, and an underwater minefield barrier. It successfully escaped after firing "a new type of Chinese-manufactured torpedo."[160] The PLAN's detailed arrangements for emergency contingencies, including the training of its personnel to operate multiple weapons systems, are based on the premise that suffering damage during future wars is inevitable.[161]

Submarine-delivered mines appear to take priority in the PLAN training regimen,[162] in part as a critical aspect of future blockade operations.[163] By 2002, mine-laying had become "one of the most common PLAN submarine combat methods and the most basic requirement of submarine warfare."[164] Accordingly, PLAN crews train to handle submarines loaded with large quantities of mines.[165] Drill variants include "hiding and laying mines in deep water"[166] in combination with such operations as torpedo launches.[167] Broad and deep mine-laying against port targets is also emphasized.[168]

PLAN officers recognize the challenges inherent in "penetrating the enemy's antisubmarine forces and laying mines behind enemy lines." According to one PLAN captain, "Secretly penetrating the combined mobile formation deployed by the enemy's antisubmarine forces is a prerequisite to fulfilling the mine-laying task."[169] Submarine detachments have practiced "difficult new tactics like 'mine laying in great depth.'"[170] China's official radio commended Chao Chunyi, a torpedo and mine officer from the PLAN submarine detachment, for cutting the loading time for mines in half.[171] Commander Ma Lixin, commanding officer of *Song* submarine 314 and a celebrity in China's naval press, recently led the efforts of an ESF submarine detachment to "develop tactical innovations." In one year, Ma researched and developed over ten new operational methods, "including how to carry out a blockade and how to lay mines using conventional submarines." In early 2005, Ma "led his unit to participate in live exercises at sea. . . ."[172] In one mine exercise, Ma was charged with evading "enemy" ASW airplanes, a minefield, and—most difficult of all—an adversary submarine, in order

to lay mines in a nearby area. He exploited his mastery of the local environment, ordered his crew to proceed at a speed that minimized noise, eluded the adversary submarine and shore radar, and accomplished the mine-laying mission on time.[173] All three of China's fleets, moreover, have reportedly trained with what appear to be advanced mobile mines. In December 2005, NSF sailors were photographed hoisting a "new type of sea mine."[174]

The PLAN has for some time pursued nuclear submarine missions of extended duration. In his recently published memoirs, Adm. Liu Huaqing relates how he raised the priority of long-duration exercises for PLAN nuclear submarines, testing all parameters of these new capabilities.[175] Apparently as part of these expanded activities, the current PLAN chief of staff, Sun Jianguo, reportedly commanded *Han* 403 during a mid-1980s' mission of ninety days,[176] breaking the eighty-four-day undersea endurance record previously set by USS *Nautilus.*[177] Chinese military medical journals demonstrate a very clear interest in undersea medicine, in particular the physical and psychological challenges surrounding lengthy submerged missions.[178]

Based on photos and anecdotal evidence, Chinese submarines go to sea frequently, though not usually for extended periods. But the submarine force seems set to range ever farther afield. According to ONI's Scott Bray,

> China claims that its submarines have conducted long-range patrols almost since the inception of the Chinese submarine force. According to Chinese press reports, PLA(N) submarines have occasionally ventured into the Pacific Ocean and, with some degree of regularity, continue to conduct these "cruises of long duration." Although China has apparently been satisfied with only a handful of these deployments every year, the growing technological capabilities of the PLA(N) submarine force and China's evolving maritime strategy, which calls for an operational capability beyond the littoral in support of an anti-access mission, create the conditions for Beijing to opt for an increased submarine presence in the Western Pacific Ocean east of the Ryukyu Island chain.[179]

MIW Forces

Particularly since 2002, when the PLA issued a new Outline of Military Training and Evaluation, PLAN surface forces have engaged in an array of increasingly realistic, increasingly complex training involving longer at-sea periods and multiple vessels of different classes. These forces, networked through various datalinks, prosecute exercises such as "beyond-visual-range attacks against maritime and shore-based targets." There still appears to be significant room for improvement in air defense and coordination with submarine and coastal defense forces.[180] Improvised exercises have also been carried out recently by sea-mine warehouse officers. An SSF mobile sea-mine warehouse, for instance, has been tasked with "Four Transformations" to improve high-speed, long-distance mobile mine transport.[181] An ESF sea-mine warehouse has conducted independent, mobile

all-weather exercises designed to ensure rapid transport of sea-mine components during enemy air raids. During these exercises, officers developed detection systems and testing instruments, then exploited terrain, weather, and darkness for camouflage.[182]

These recent efforts coincide with the new emphasis on MIW as a major surface-fleet mission. The PLAN has stressed automation and electronics that facilitate "all-weather" mine-laying capabilities.[183] *Jianghu*-class frigates have conducted mine-laying as part of their ASW training.[184] Minesweeping units have recently practiced laying various types of moored and deep bottom mines as part of fast-paced confrontational exercises. One SSF minesweeping unit has recently participated in over ten such exercises, involving "network-centric training" and "the intelligization of sea mines."[185] In 2002, an NSF unit including minesweepers 813 and 811 attacked submarines with "both foreign and domestic torpedo sea mines" with a "100% success rate."[186]

Certain units have been hailed for training innovations. An SSF minesweeper unit's "Flagship" 809 was rewarded for achieving repeated PLAN firsts.[187] The unit established a "Night Training Implementation Leading Small Group" to increase the difficulty of training. The unit's officers used GPS, radar, and handheld location systems to arrive in an unfamiliar area within two meters of required position. This use of multiple navigation systems represented a hedge against any one system becoming unavailable under combat conditions. In 2000, ship 809 established a "Warfare and Training Methods Discussion Group," which studied how to counteract electronic interference, counter high-performance enemy sea mines, defeat over-the-horizon missile attacks, and disrupt potential opponents' operational concepts, as well as both deployed and future equipment. Since 2001, ship 809 has developed twelve new tactics to "counter-electronically jam" advanced enemy mines and over-the-horizon missile attacks. In 2003, *People's Navy* reported that ship 809 had conducted the PLAN's first opposition-force MIW exercise. By 2003, the vessel was routinely and successfully clearing all types of mines, day or night and in all types of weather, using on-the-spot decision-making under a wide variety of uncertain and realistic conditions.[188]

A disturbing potential component of PLAN operations in general, and of mine-laying in particular, is the use of civilian assets to supplement military assets. Over the past few years, each navy unit has reportedly organized militia units—which constitute "an important force in future maritime warfare"—into training-equipment, management, applications, and safeguard groups, in an effort to gain experience and develop new methods "to fulfill mission requirements." An ESF exercise using civilian vessels includes a focus on clearing various types of mines.[189] A Chinese naval periodical offers perhaps the first photo available in the West showing how the PLAN might use civilian ships for MIW. In December 2004, a PLAN base mobilized six civilian ships for a drill

that involved, among other activities, reconnaissance, "mine laying by fishing boats," and non-pier and at-sea supply of naval vessels in battle.[190] Another report details the equipment requirements (e.g., cranes) for loading mines at remote ports. Such precautions assume that wharves at major naval bases will be destroyed by enemy PGM strikes in wartime, requiring MIW forces to work around battle damage.[191] This training imperative is described in multiple publications as a "non-wharf" exercise.

PLANAF

Since 2002, PLANAF training has been increasingly rigorous, with exercises involving extended duration, increasingly unfamiliar conditions, and on-the-spot decision-making:

> pilots fly more long-distance, over-water, cross-border missions during the day and night. Many of the flights are at minimum altitude (i.e., below 100 meters) or low altitude (above 100 meters) and in poor weather conditions. Vessels with helicopters have focused on helicopter operations during day and night that are gradually moving further from the vessel.[192]

An SSF exercise in August 2002 exemplified the progress of the air force in such missions. Aircrews dropped mines from bombers in an unfamiliar location under "realistic" conditions, while opposed by simulated adversary forces. The exercise involved a combat aircraft group consisting of three bomber groups, an electronic-jamming aircraft, and escort fighters. The electronic-jamming aircraft jammed the enemy's radar, while the combat-aircraft group employed minimum-altitude tactics, quickly dispensing several tens of mines and torpedoes.[193] Another source, probably reporting on the same exercise, relates how adversary "red force" bombers laying mines in the SCS were intercepted and attacked by Chinese "blue force" fighters.[194] During the Sino-Russian "Peace Mission 2005" exercise, Chinese Su-27 and J-11 fighters reportedly escorted naval units, J-8II fighters performed intercepts, and H-6 bombers dropped precision-guided weapons. In the process, the arguably more advanced PLAAF likely gleaned insight into the Russian Air Force's sophisticated air-combat doctrine, tactics, and techniques for long-range strike.[195]

Despite recent efforts, it remains unclear how proficient China's different services are at joint warfare, particularly in an over-water environment. While the educational requirements for PLANAF pilots, which already exceeded those for most other PLAN forces, were granted bachelor's-degree status in 2001, naval aviation has traditionally been poorly funded. PLAN pilots fly only a fraction of the hours that their peers in the United States, Japan, and even India do on an annual basis: "it appears that Naval Aviation combat aircraft pilots average around 125 hours. Furthermore, most units normally fly only three days per

week. Each training sortie for fighter and attack aircraft also averages around 45 minutes."[196] Integrating operations between highly regimented, rigidly structured PLAAF units and immature, sea-based PLAN units would require technical and service-culture innovations, as well as exercises that are less carefully scripted than has been the case in recent years, to develop the requisite interoperability and interservice coordination. Significant additional research is required to gauge how much coordination exists among PLAN land-based naval air and surface/subsurface assets. This is all the more critical, as the type and degree of coordination will necessarily vary depending on the maritime mission assigned. China's development and procurement of increasingly advanced aircraft will not automatically solve the lack of practical experience with these platforms. Indeed, as China's experience has demonstrated, mastering them will involve the loss of expensive aircraft and hard-to-replace pilots.

PLAN Doctrine

China's military lexicon contains no term for "doctrine." Depending on the operational level of conflict referenced, it is more appropriate to refer to strategy, campaigns, and tactics.[197] At the strategic level, the PLAN receives guidance analogous to that of the other PLA service branches. The "National Military Strategic Guidelines for the New Period" offers the "highest level of strategic guidance for all PLA military operations during war and preparation for war during peacetime." The most likely scenario Beijing expects to face is "local wars under modern high-tech conditions." As articulated in the Guidelines, the concept of "active defense" instructs the PLA to prepare to undertake a variety of sophisticated offensive measures simultaneously, targeting enemy weaknesses within this larger strategic context. Doctrine has evolved rapidly to address new challenges: the PLAN "has published an entirely new set of revised guidance documents since the end of the 9th Five-Year Plan (1996–2000)." Since the beginning of this decade, the PLA has sought to implement this guidance through its "Two Transformations" program, using informatization and mechanization to transform itself from a personnel-intensive into a technology-intensive force.[198]

It is only at the tactical level, and to some extent at the campaign level, that the PLAN possesses a "doctrine" distinguishable from larger PLA thinking. The PLAN's strategic guidance is currently conveyed by eight Chinese characters that together mean "active defense, offshore operations." The former "four characters" apply more generally to all PLA service branches, informing military strategy and military-strategic guidelines. The latter "four characters" refer to the PLAN's area of responsibility.[199]

The major generals who edited the PLA's first English-language volume on strategy offer a naval context for China's preparations to fight and win local wars under modern high-tech conditions. They foresee possible threats to

China's "sovereignty, maritime rights, and great cause of reunification" with Taiwan. Such threats may necessitate a defensive, "just war" along China's "borderlines, seacoasts, and air spaces." They state that China is unusual in the number and magnitude of its territorial disputes: one million square kilometers of maritime territory, or "one ninth of China's national land territory," remains under contention.[200] The authors discuss energy, a factor that increasingly influences Chinese strategists. To "ensure the security of [the] channel[s] of [our] strategic energy supply," they observe, is "of great significance to our development in the long run."[201] The authors voice concerns that remaining challenges in long-distance power projection, operations, and logistics will make these battlefields very different from "inland war fields," and thereby "disadvantageous to us."[202] To address these disparities, the authors suggest integrating civilian and military forces, combining "regular warfare with guerilla warfare on the sea," employing asymmetric "trump card" weapons, mixing "high-tech weapons with common weapons," and blending military operations with political, economic,[203] and legal measures within the larger politico-military effort.[204]

PLAN doctrine appears to have evolved with both external security threats and China's ability to project power. From its inception on April 23, 1949 until 1985, the PLAN was charged with coastal defense. As a subordinate organization, the PLAN was assigned to support PLA ground forces in what Mao envisioned as a major land war against the superpowers. Following the 1972 rapprochement with the United States, this concern applied solely to the USSR.

During the late 1970s, however, evidence emerged that China might be moving beyond a policy of coastal defense. The PLAN sent submarines into the SCS, as well as beyond the "first island chain" into the Pacific Ocean, for the first time. In January 1977, specifically, submarine 252 performed a 3,300 nautical mile voyage in Pacific waters. In July of that year, submarine 296 carried out successful diving tests in the SCS.[205] By the mid-1980s, the PLAN had developed a broader ability to conduct "offshore operations" as part of its larger naval strategy predicated on offshore defense.

An "offshore defense strategy" was formally approved in 1985 by Deng Xiaoping and the other members of China's Central Military Commission.[206] This major paradigm shift was driven by Deng's assessment that great-power war would not occur for some time and that coastal economic development should take precedence. Increasing concerns over maritime resources and sovereignty—particularly with regard to Taiwan as the island began to democratize in the late 1980s, raising popular questions about its status vis-à-vis the mainland—accelerated the process. Liu Huaqing further articulated and implemented the new strategic paradigm. In 1983, Adm. Liu recalls,

> I stressed that we should achieve a unified understanding of the concept of "offshore" according to Comrade [Deng] Xiaoping's instructions. Our "offshore" areas are the Yellow Sea, East China Sea, South China Sea, the seas around the Spratly Islands and

Taiwan and inside and outside the Okinawa island chain, as well as the northern part of the Pacific.

As with similar terms, "offshore defense" does not relate to specific geographic distances *per se,* but rather to conceptual areas for naval defense and power projection, progressively farther from shore. The distances to which this and similar terms pertain, while relative instead of absolute, do appear to have expanded in scope as the PLAN's warfighting capacity has expanded. This process will likely continue apace. At present, the extent of offshore defense appears to be "as far as the PLA Navy's capabilities will allow it to operate task forces out at sea with the requisite amount of support and security. For many PLAN officers, this is still a function of the operational reach of the PLA's landbased aircraft and the PLAN's antisubmarine warfare capabilities."[207] To date, however, perhaps to preserve strategic flexibility, Beijing has refrained from publicly and precisely defining these terms, making it necessary to examine PLAN capabilities in order to gain insight into China's intentions.

Island Chains—Benchmarks of PLAN Force Projection?

How then to demarcate China's progress in projecting power farther from its shores? As Senior Captain Xu Qi of the PLAN emphasizes, China's "passage in and out of the [open] ocean is obstructed by two island chains. [China's] maritime geostrategic posture is [thus] in a semi-enclosed condition."[208] The authors of the PLA's first English-language volume on strategy likewise believe that despite its 18,000 kilometer coastline, China is currently constrained by the world's longest island chain, centering on the strategically, politically, and economically vital territory of Taiwan: "If Taiwan should be alienated from the mainland . . . a large area of water territory and rich reserves of ocean resources will fall into the hands of others. . . . China will forever be locked to the west side of the first chain of islands in the West Pacific."[209]

Adm. Liu and others have defined the first island chain, or the current limit of most PLAN operations, as being formed by Japan and its northern and southern archipelagos, South Korea, Taiwan, the Philippines, and Indonesia (from Borneo to Natuna Besar). The second island chain, which Liu envisioned as being in range of future PLAN operations, runs from the Japanese archipelago south through the Bonins, the Marianas (including Guam), the Carolines, and Indonesia.[210] The first two island chains thus "encompass maritime areas out to approximately 1,800 nm from China's coast, including most of the East China Sea and East Asian SLOCs."[211] While a 2004 issue of China's official *People's Daily* mentions only two "island chains," the first and the second,[212] some unofficial Chinese publications even refer to a "third island chain" centered on America's Hawaiian bases, depicting this as a "strategic rear area" for the U.S. military.[213]

Chinese analysts thus view the "island chains" alternatively as benchmarks of China's progress in maritime force projection and as fortified barriers that China must continue to penetrate to achieve freedom of maneuver in the maritime realm. The ultimate goal is a Chinese navy that can perform a mix of sea denial, area denial, and varying degrees of power projection in waters enclosed by these island chains.

Command, Control, and Communications

A critical question concerns how Chinese doctrine regulates command, control, and communications (C3). Centralized C3 is essential for SSBNs, particularly in the highly centralized PLA. Insights into C3 are extremely difficult to obtain, but recent research relevant to China's submarine force offers preliminary suggestions. According to John Wilson Lewis and Xue Litai, China's SSBN force, like all other nuclear units, is overseen by the Strategic Forces Bureau. This is intended to ensure that "Only the [Central Military Commission] Chairman —not China's president—has the authority to launch any nuclear weapons after getting the concurrence of the Politburo Standing Committee and the [Central Military Commission]."[214]

The PLAN has been working to achieve secure, reliable SSBN communications for more than two decades. On April 16, 1984, according to Adm. Liu Huaqing, China used "the satellite communications system for our nuclear-powered submarines to test the channels" of the Dong Fang Hong-2 communications satellite, which had been launched eight days before. "The navy's satellite communication system for its nuclear-powered submarines was the first one to open a test communication line with the satellite," Adm. Liu reports. "The success of the nuclear-powered submarine's experiment on instantaneous transmission of messages via the satellite . . . pushed China's submarine communication to a new level."[215] China has since launched a variety of increasingly advanced military and dual-use communications satellites that are believed to support related capabilities.[216]

However, it is unclear to what extent centralized C3 is possible for Chinese SSBNs across the range of nuclear scenarios. "At present China's communications infrastructure is vulnerable to a first strike," Garth Hekler, Ed Francis, and James Mulvenon contend. "As a result, the SSBN commander would require explicit and restrictive rules of engagement and . . . targeting data, lest crisis communications with Beijing reveal [the SSBN's] position to hostile attack submarines or if the submarine is cut off from Beijing after a decapitating first strike." On the broader question of submarine-force C3 doctrine, these authors suggest that while the PLAN "may recognize the effectiveness of decentralized C3 for certain types of submarine missions, it appears to be seeking to create a more tightly centralized submarine C3 system by developing

command automation, network centric warfare strategies, and advanced communications technologies."[217]

Operational Responses

PLA writings indicate that the PLAN has been tasked to prepare to conduct six major types of campaigns: sea-to-land attack, antiship operations, defense of naval bases, protection of sea transportation, sea blockades, and commerce raiding.[218] The latter three missions offer a possible rationale for the PLAN to develop capabilities to project power beyond Taiwan. Given the paucity of available PLA analyses relevant to such SLOC security missions, it is useful to examine here one of the very few that directly addresses the subject.

The Science of Campaigns, an operationally and tactically focused doctrinal textbook that seems to focus on a Taiwan contingency, was published by China's National Defense University in 2000. While it is unclear whether the book enjoys the imprimatur of China's senior political leadership, it certainly represents the views of eminent military intellectuals, and thus undoubtedly reflects elements of critical policy trends in Beijing. Chapter 12, "Naval Campaigns," contains detailed discussions of how the PLA might counter blockades, most obviously during a Taiwan scenario.[219] The authors seem to subscribe to generic "Mahanian" theories of sea power. "It is decisively significant to find and assault the enemy first," the authors state.[220] "We should try to make the first attack a success."[221] The chapter repeatedly stresses the primacy of offensive initiative to secure command of the sea, referencing such classic fleet-on-fleet engagements as Jutland, Tsushima, and Midway. They accentuate the importance of offense, even in situations of Chinese weakness: "SLOC attack campaigns are not always conducted in situations in which we have superiority. When our naval strength is in an inferior position, and we want to conduct systematic sabotage against enemy SLOCs, the campaign will probably last longer."[222]

The need for the PLAN to attack a variety of enemy targets is also emphasized:

> The SLOC attack campaign not only needs inshore SLOC attack, but also needs SLOC attack in the deep sea in order to achieve good campaign effect. Under normal situations, we should attack enemy transportation ships. Nevertheless, in order to accomplish this goal smoothly, we often need to attack enemy escort warships first, even the enemy campaign-covering-escort. Sometimes, we even need to attack the enemy loading and unloading ports, docks, and airports.[223]

The authors definitely appreciate the value of offensive, not just defensive, mining.[224] For instance, in a section entitled "Attacking and Blocking Enemy Loading and Unloading Ports," the authors state, "we will concentrate the main force on attacking enemy ports, loading and unloading equipment, and transportation ships. When attacking enemy ports, a portion of air force bombers as well

as submarines are used to deploy sea mine barriers in the water channels outside of enemy ports to blockade them."[225]

Active-defense concepts allow for offensive actions even in a Chinese SLOC-protection campaign. For instance, "active and initiative local offensive operations are an effective measure to reduce and limit enemy capabilities for transportation sabotage combat in a transportation defense campaign."[226] Specifically, "in order to weaken and limit enemy capabilities for SLOC attack, we sometimes need to attack and blockade enemy bases and airports."[227] The authors argue that China's level of offensive measures in a SLOC defense campaign should vary both with relative capabilities and with the operational situation: "[W]hen one has a stronger operational force, launch an active offensive to attack the enemy's SLOC attack force. . . . [W]hen one does not have the ability to conduct an active attack and the enemy does not attack us, we start to launch transport activities under concealment. . . . [W]hen the enemy has started blockade and attack activities, we start the campaign with various anti-blockade and counterattack combat activities."[228]

Despite emphasizing offensive fleet action throughout the chapter, however, the authors acknowledge that the dispersed nature of combat and fleet operations today makes obtaining a single decisive battle difficult.[229] The authors' Mahanian approach, which equates to "the best defense is a good offense," appears difficult to reconcile with a strategy for the protection of friendly shipping—a difficult, asset-intensive, defensive mission. Not surprisingly, the authors appear to have struggled with this dilemma as much as Mahan did, as all of Mahan's disciples have, and as the U.S. Navy does today. The authors acknowledge that protecting shipping is a defensive mission and that scarce assets will likely limit a navy's ability to protect all shipping.[230] But when it comes to presenting a solution for this dilemma, they fall back on the primacy of offense. This is highlighted by the authors' caveat that "Generally speaking, the SLOC protection campaign is a defensive campaign. Nevertheless, active and initiative local offensive operations are an effective measure to reduce and limit enemy capabilities. . . ."[231] The rest of the paragraph advocates seizing opportunities to attack first whenever they present themselves, even when performing a "defensive" mission. This dovetails with Mahan's theory that the best way to protect one's own shipping is to seek out and destroy the enemy's fleet, sweeping his flag from vital waters.

"Naval Campaigns" urges both sophisticated knowledge of the strategic and campaign/operational levels of warfare and an integrated air/surface/subsurface approach to planning. Despite this exhortation, however, a warning about friendly fire considerations[232] suggests that PLAN strategists harbor some doubts about the navy's ability to coordinate complex operations. Friendly-fire deconfliction severely challenges even the best navies (especially in ASW), so the authors' comment that blockading forces "must not trespass" on other friendly forces' areas is rather telling. Numerous references to both "hard" and "soft"

means of defeating a naval adversary indicate that they appreciate the value of electronic warfare and of tactical and operational deception. The authors routinely stress the need for good intelligence and reconnaissance in support of naval operations. The level of ISR the authors require seems to exceed current PLAN capabilities even seven years later, however, and thus may represent advocacy on behalf of increased capabilities.

The authors repeatedly discuss the need for air superiority, and in each section they provide recommended guidance for the employment of fighter aircraft. This would be relevant for a Taiwan scenario, but, since the PLAN currently lacks carrier-based aircraft, not for missions beyond the range of land-based air. The authors are either discussing Taiwan or implicitly lobbying for a PLAN aircraft-carrier capability or both. The section on "Organization and Covering Transport Ships to Load and Unload and Leave Port" seems to contemplate a naval expeditionary task force assembling to steam to one common objective, as opposed to an ordinary convoy of merchant/cargo ships cruising along the Chinese coast.[233] While these statements need to be compared with those in other PLAN doctrinal writings as they become available outside China, it seems reasonable to conclude that Beijing will not accept a maritime energy blockade and is already developing serious countermeasures.

Inferences About China's Modernization Plan

China's evolving platforms and weaponry point to an access-denial strategy that is wholly consistent with Beijing's focus on the Taiwan issue. There is no doubt that the PLA is fully committed to dominance of the littoral battlespace around China, with an intense focus on the waters and airspace around Taiwan. Everything the PLA is developing, with the exceptions of its ICBM force, its SSBNs, and perhaps its SSNs and LPD, seems to be devoted to this cause. Some of the PLA's more modern ships and aircraft will allow it to extend its combat power slightly farther, into the SCS, and to a limited extent into parts of the western Pacific. The PLAN is also capable of sending limited numbers of warships on occasional transoceanic cruises. These deployments, however, are severely limited by the navy's limited number of replenishment vessels. While China's shipyards are fully capable of building vessels that could perform at-sea replenishment operations, they evidently are not doing so. This suggests that, at least for the time being, China is limiting its military focus to matters closer to home.

Specifically, China's power-projection capabilities are focused on a Taiwan contingency. There is little evidence to show that the PLAN is developing the capabilities necessary to extend its ability to project power (as the United States would conceive of it) much beyond China's claimed territorial waters. Granted, PLAN ships carry sophisticated long-range ASCMs, and some of their aircraft

can carry LACMs. The newest SSNs might be similarly equipped as well. But the PLAN does not have the capability to deploy to distant areas and establish an oceanic sanctuary from which it can conduct military strikes against opposing navies or targets ashore.

However, such an interpretation does not capture the full range and potential ambition of China's naval development. "China's maritime strategy is evolving along two paths," explains ONI's Scott Bray. "First, China is focused on a regional anti-access capability, which is principally applicable in preventing third-party intervention in a Taiwan scenario. Second, China is simultaneously expanding its maritime strategy to include a mission to protect China's growing dependence on maritime commerce for economic development."[234] China's growing surface forces could well support missions beyond Taiwan. Indeed, many of China's amphibious craft are based at Zhanjiang in the SSF—rather distant from the Taiwan Strait. Increasing air-defense capabilities hint at genuine blue-water ambitions, since land-based aircraft have sufficient range to cover most missions associated with Taiwan contingencies. After all, PLAN ships would benefit from land-based air cover when operating near the Chinese coast. In a similar vein, rumors of Chinese aircraft-carrier development have intensified and even reached quasi-official status.[235]

Here it is useful to reflect on the challenges the United States faced as it sought to accurately understand Japanese naval development prior to World War II. In a sobering essay, Thomas G. Mahnken, now the U.S. deputy assistant secretary of defense for policy planning, demonstrates that, despite the U.S. Navy's making war with Japan its primary planning contingency, allocating considerable resources to analyze this contingency, and exploiting the large amount of relevant information in open sources (95 percent, in the view of the U.S. naval attaché in Tokyo),[236] mirror imaging, ethnocentric assumptions, and lack of imagination caused U.S. analysts to miss revolutionary Japanese tactical and technological innovations. Because of such shortfalls, the U.S. Army and Navy "repeatedly discounted credible reports that Japan had achieved a capability that the United States lacked, whether it was the Type 91 long-range armor-piercing naval shell, the Type 93 oxygen-propelled torpedo [which boasted not only a minimal wake but also a range over four times that estimated by the U.S.], or the Type 0 fighter."[237] As one former head of ONI's Far East Section, Arthur H. McCollum, recalls, "The tendency was to judge technical developments on the basis of our own technology and on the assumption that our technology was superior to any other. So if something was reported that the Japanese did have and we didn't then, obviously, it was wrong."[238] Of course, one hopes the United States never enters into a conflict with China along the lines of the Pacific War with Japan. These lessons are nonetheless vital to understanding China's rapid if complicated maritime development and its rise as a great power in East Asia and the world.

The United States, China, and Regional Naval Relations: Competitive Coexistence

The evolving contest for East Asia's seas will loom large on the Asia-Pacific security agenda for the foreseeable future. The interaction of threat perceptions, strategies, and force structures among China, other Asian nations, and the United States will make for both cooperation and competition. Chinese analysts view their nation's actions as inherently defensive. They conceive of naval forces as performing a deterrent function, independent of these forces' combat role: "The challenge that China's maritime sovereignty faces is not a problem of actual combat strength between 'Number Two' and 'Number One.' It is rather a problem of effectively deterring the enemy from carrying out provocations."[239] With respect to Taiwan, a senior Chinese official told the author, "We can win a war with the U.S. without nuclear weapons [because the] U.S. is coming to us."[240] In a landmark study, John Wilson Lewis and Xue Litai conclude that despite the continuing difficulties China confronts as it seeks to match Western technology and even organization, Taiwan's importance to Chinese identity, strategic value, and position as a bellwether of national territorial integrity justify extraordinary expenditure of blood and treasure. Moreover, China's military planners appear to believe that by investing selectively in asymmetric weapons, they can reconcile these conflicting realities without fuelling an arms race and hence mutual insecurity.[241] With a burgeoning shipbuilding industry and maritime commercial sector, not to mention an intensifying dependence on foreign sources of natural resources, PLAN admirals find it easier and easier to persuade their civilian leadership that the PLAN should take its place as a major instrument of Chinese power.

Rapid development and acquisition of submarines, naval mines, missiles, and other anti-access weapon systems appear to be part of a larger Chinese effort to prevent the United States from operating effectively in the East Asian littoral, particularly in the event of a crisis in the Taiwan Strait. While U.S.–China relations have improved considerably since September 11, 2001, which helped to ameliorate Chinese resentments concerning the April 2001 EP-3 incident and the May 1999 bombing of China's embassy in Belgrade, emerging trends concerning Taiwan suggest the lingering potential for conflict. U.S. naval planners must prepare for a variety of disturbing Taiwan contingencies, including a decapitating missile strike and a PLAN blockade that relies heavily on submarines and naval mines. As Thomas Christensen writes: "The proximity of Taiwan to the mainland . . . Taiwan's massive trade dependence . . . the inherent difficulty in clearing mines, and the extreme weakness of American mine-clearing capacity, particularly in [the Pacific] theater . . . all make blockade a tempting . . . strategy for . . . China. . . ."[242] The end of the Cold War has also shifted the thrust of U.S. naval operations from force projection on the open seas to joint operations in easily blocked

littorals—thus greatly increasing the importance of mine countermeasures for coastal states that might find themselves the targets of U.S. naval action.

A war between China and the United States over Taiwan should be avoidable—provided the United States honors its commitment to the "One China" principle by consistently opposing Taiwan independence and Beijing addresses the concerns of Taiwanese voters understandably determined to safeguard their democratic way of life. Unfortunately, current Taiwanese president Chen Shuibian, who has a history of provoking Beijing, has recently made a series of extremely dangerous pro-independence statements. On March 4, 2007, Chen publicly declared that Taiwan has "Four Wants and One Without": (1) "Taiwan wants independence," (2) "Taiwan wants rectification of the country's name" (i.e., changing it from "Republic of China" to "Taiwan," including in the case of local firms whose names currently contain the word "China"), (3) "Taiwan wants a new constitution," and (4) "Taiwan wants development." The "One Without" is "Taiwan does not have a left-right political problem"; it has a national identity problem, and the question is independence or unification with China.[243] These statements, which threaten to cross redlines that Beijing has clearly drawn, directly contravene Chen's 2000 election pledge of the "four no's and the one won't," in which he committed "not to declare independence, change Taiwan's name or hold a referendum on the independence issue."[244]

In a sign that Chen is far from enjoying a monopoly on Taiwanese public opinion, the Nationalist Party, or KMT, disavowed the president's machinations as a "disaster for Taiwan." The People's First Party, a KMT ally, "filed a civil lawsuit . . . charging Chen with sedition" because "his remarks could lead to war, impacting Taiwan and other parts of the world," according to party spokesman Lee Hung-chun.[245] The bottom line is that Washington cannot let Taipei declare independence, which would be a disaster for all involved. Lest U.S. concerns about free riding continue to increase, Taipei will also need to do more to "tend to its own defenses."[246] In a larger strategic sense, the United States and China will need to develop a positive but realistic understanding of their respective roles in the Asia-Pacific that might best be termed "competitive coexistence."

Perhaps even more difficult to reconcile in the long run will be Japan's regional maritime role and its relations with China. While Japan's defense and foreign policy have changed dramatically since it opened up to the world in 1853, SLOC security has endured as a primary national security concern. Official Diet testimony holds that "the greatest cause of [Japan's World War II] defeat was the loss of shipping" to Allied interdiction efforts.[247] These persistent concerns have been raised anew by China's reemergence as a sea power. A key indication is former Prime Minister Hashimoto's worry that "many commercial flights and aircraft [were] forced to divert around those areas affected" by China's March 1996 missile tests, during which "some of the missiles landed in waters only 60 km from [Japan's] Yonaguni island. . . ."[248]

As a result, Japan is gradually strengthening its maritime-defense and power-projection capabilities. In October 2004, the JMSDF and Coast Guard led Northeast Asia's first Proliferation Security Initiative exercise. In the Indian Ocean in 2006, the JMSDF fuelled allied vessels to support operations in Afghanistan. Meanwhile, Japan is struggling to assert control over its exclusive economic zone, some of which is in dispute. Japanese policymakers, motivated by increasingly "realist" threat perceptions, are exploring new directions in their pursuit of SLOC security. The extent to which these emerging impulses can transcend funding constraints imposed by demographic and economic challenges, as well as constitutional questions over the use of force on the part of the Japanese armed forces, remains a pivotal question for both Chinese planners and for East Asian maritime security.

Overall Assessment

The authors of the PLA's first English-language volume on strategy describe the current age as an "era of sea" in which maritime states, like their predecessors, will employ Mahanian and other strategies to "actively develop comprehensive sea power" and "expand strategic depth at sea."[249] China seems to be adapting to the seas by applying various strands of Western thought to its own unique understanding of and experiences with sea power, as well as its larger history and strategic traditions. For example, Mahan's emphasis on trade following the flag is accepted in China long after falling out of favor in the West, but aggressive power projection is rejected as being alien to Chinese strategic culture. Long-range influence is described as peaceful and nonmilitary in nature, while "for military circles in China, command of the sea means one side in a conflict having control over a specific sea area for a specific period of time."[250]

As Chinese strategists look seaward, they seem in particular to invoke the thinking of Mahan. It is difficult to determine, however, how sophisticated their appreciation of Mahan is, as aspects of his teachings seem to have been adopted rather uncritically, for rhetorical purposes at least. Perhaps Mahan's thought represents a model of Western—particularly American—success in developing comprehensive national power, especially in the maritime realm. This model can serve flexibly as a touchstone for China's own sea-power aspirations, much as the Ming Dynasty mariner Zheng He's legacy now serves as a sounding board for Chinese maritime ideology and conceptions of maritime moral exceptionalism, independent of the exact historical details of his voyages.