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**China's Naval Modernization
and
Implications for the United States**

by

Craig Murray
Senior Policy Analyst, Military and Security Affairs

Andrew Berglund
Research Fellow, Military and Security Affairs

and

Kimberly Hsu
Policy Analyst, Military and Security Affairs

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Executive Summary

In the late 1980s, China began a modernization program to transform the People's Liberation Army (PLA) Navy from a coastal force into a technologically-advanced regional navy. China's acquisition of platforms, weapons, and systems has emphasized qualitative improvements, not quantitative growth, and centered on improving its ability to strike opposing ships at sea and operate at greater distances from the Chinese mainland. The PLA Navy has made significant progress, particularly since the late 1990s. Today, it is able to conduct high intensity operations in China's immediate periphery and carry out low intensity operations around the world. Trends in China's defense spending, research and development, and shipbuilding suggest the PLA Navy will continue to modernize through at least 2020. China's increasingly advanced and adaptive naval capabilities – many of which appear to be designed to restrict U.S. freedom of action throughout the Western Pacific – could undermine U.S. interests and security in the region.

Drivers of China's Naval Modernization*

For over 30 years following the People's Republic of China's (PRC) establishment in 1949, the PLA Navy was a coastal force comprised of large numbers of low capability platforms. Its primary mission was supporting the army's efforts to deter and, if necessary, defend against a foreign amphibious invasion. However, China's interests expanded beyond the country's territorial boundaries in the late 1970s and early 1980 as China's economy grew and threat perceptions evolved. This incentivized Beijing to pay more attention to the maritime domain and to build a modern navy capable of playing a larger role in China's national security.¹

Events of the 1990s – including the success of U.S. long-range, precision strikes in Operation Desert Storm in 1991 and the U.S. deployment of two aircraft carrier battle groups during the Taiwan Strait Crisis in 1995-96 – demonstrated to Beijing that the United States might be willing to intervene in a regional conflict involving China and could do so effectively. This led Beijing to accelerate its naval modernization and to focus on developing capabilities to counter foreign intervention in Chinese affairs, particularly U.S. naval and air operations in a Taiwan contingency.²

In 2004, Beijing issued a directive to the PLA to prepare for nontraditional missions beyond China's immediate periphery, including international peacekeeping operations, humanitarian assistance, and counterterrorism. In Beijing's view, these missions are essential to China's development because they help extend China's global influence, portray China as a responsible player on the world stage, and support international stability. Linking China's economic and strategic interests abroad to the PLA created a requirement for the PLA Navy to be able to project power on a limited basis.³

China's Naval Strategy

China's naval modernization is guided by an overarching strategy, which Chinese documents refer to as Offshore Defense (*jinhai fangyu*). Offshore Defense is a flexible concept that the PLA Navy updates as necessary to incorporate its growing capabilities and force restructuring, lessons learned from exercises and training, and the most recent high-level guidance and threat assessments. Offshore Defense seeks to achieve the following strategic objectives:

* In this report, "naval modernization" refers to the modernization of the PLA Navy, as well as to the modernization of other Chinese weapons, platforms, and systems that are designed for use in the maritime domain.

- Deter and defend China against foreign military intervention in Chinese affairs, such as peacetime foreign military operations near China that Beijing judges threaten its interests and foreign amphibious invasions, blockades, and strikes against the Chinese mainland.
- Deter and reverse any moves by Taiwan toward *de jure* independence.
- Develop a sea-based nuclear force to support Beijing's nuclear deterrence strategy.*
- Deter and defend against threats to China's maritime trade routes.
- Deter and defend against challenges to China's maritime territory, sovereignty, and resources.
- Protect China's interests abroad.⁴

During peacetime, Offshore Defense emphasizes gaining control of China's near seas[†] and steadily expanding China's maritime perimeter out to the Second Island Chain.[‡] During wartime, the strategy calls for engaging opposing naval forces as far from the Chinese coast as possible and, if necessary, overwhelming those forces as they approach China. The most important wartime task is to prevent foreign military forces from interfering with China's wartime objectives.⁵ The U.S. Department of Defense (DoD) characterizes these operations as "anti-access/area denial." China, however, uses the term "counterintervention," reflecting its perception that such operations are reactive.⁶

There are indications Beijing is considering a new naval strategy, often referred to as Distant Sea Defense (*yuanhai fangwei*),[§] to provide a better framework for the PLA Navy to pursue the greater range and complexities of its expanding roles and missions. The major difference between Offshore Defense and Distant Sea Defense is that the latter envisions the PLA Navy conducting longer-range surface and submarine patrols, defense of more distant maritime trade routes, and more regular and robust military missions other than war. Whether or not China continues to adhere to Offshore Defense or adopts a new strategy, most U.S. analysts agree the PLA Navy will continue to focus on China's near seas and will not soon develop capabilities for persistent global power projection.⁷

Select Elements of China's Naval Modernization

C4ISR**

China is deploying a new generation of C4ISR systems and networks, including communications networks, data links, intelligence collection systems, navigation satellites, and information fusion

* The primary objectives of China's nuclear deterrence strategy are to deter nuclear and conventional attacks; should deterrence fail, survive a nuclear attack and conduct a nuclear counterstrike; prevent an adversary from using the threat of nuclear weapons to coerce China or compel it to back down; and strengthen China's global image. U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: 2013), pp. 29-31.

[†] China usually defines its "near seas" as waters within the Yellow Sea, East China Sea, and South China Sea.

[‡] The Second Island Chain refers to a line that stretches from the Kurile Islands through Japan, the Bonin Islands, the Mariana Islands, the Caroline Islands, and Indonesia. It encompasses maritime areas out to approximately 1,800 nautical miles from the Chinese mainland.

[§] China typically describes its "distant seas" as waters that are outside of the Yellow Sea, East China Sea, and South China Sea.

** C4ISR refers to command, control, communications, computers, intelligence, surveillance, and reconnaissance.

systems. These C4ISR capabilities will be the key factor in the PLA's ability to coordinate operations within and among its ground, air, naval, and missile forces; detect and track foreign military activities throughout the Western Pacific; and conduct time-sensitive, long-range strikes with its ballistic and cruise missiles.⁸

Antiship Ballistic Missiles

In 2010, China deployed the DF-21D antiship ballistic missile (ASBM). The DF-21D, which has a range exceeding 810 nautical miles (nm), provides Beijing with the ability to threaten large surface ships, such as U.S. Navy aircraft carriers, throughout the Western Pacific. China is fielding additional DF-21Ds and may be developing a variant capable of reaching ships at longer ranges.⁹

Cruise Missiles

China has fielded multiple classes of antiship cruise missiles (ASCMs) aboard the PLA Navy's growing inventory of mobile launch platforms (submarines, surface combatants, and aircraft) and to land-based units along the Chinese coast. These include Russian ASCMs, such as the SS-N-22 (130 nm) and the SS-N-27 (120 nm), as well as Chinese ASCMs, such as the YJ-62 (150 nm), the YJ-83 (95 nm), the YJ-82 (65 nm), and the YJ-8A (65 nm). China also has deployed multiple classes of surface-to-air missiles (SAMs) on its modern destroyers and frigates. These include Russian SAMs, such as the SA-N-20 (80 nm) and the SA-N-7 (12-20 nm), as well as Chinese SAMs, such as the HHQ-9 (55 nm) and the HHQ-16 (20-40 nm).

China's ASCM and SAM research, development, and production has accelerated since the early 2000s, and future missiles will have longer ranges and enhanced survivability, lethality, and employment flexibility. China also is developing an indigenous supersonic ASCM.¹⁰

Although the PLA Navy has a significant inventory of ASCMs, it currently does not have the ability to strike land targets. However, the PLA Navy recently began to develop submarine- and surface-launched land attack cruise missiles (LACMs). A future sea-based LACM will complement the PLA's air- and ground-based LACMs and ballistic missiles, enhancing Beijing's flexibility for attacking land targets throughout the Western Pacific and beyond.¹¹

Nuclear Ballistic Missile Submarines

China's JL-2 submarine-launched ballistic missile (SLBM) likely will reach initial operational capability by late 2013.¹² The JL-2, when mated with the PLA Navy's JIN nuclear ballistic missile submarine (SSBN), will give China its first credible* sea-based nuclear deterrent. The JIN SSBN/JL-2 weapon system will have a range of approximately 4,000 nm, allowing the PLA Navy to target the continental United States from China's littoral waters.¹³ China has deployed three JIN SSBNs and plans to field as many as five by 2020.¹⁴ China also is developing its next generation SSBN, the Type 096,¹⁵ which probably will improve the range, mobility, stealth, and lethality of the PLA Navy's nuclear deterrent.

Aircraft Carriers

In 2012, China commissioned its first aircraft carrier, the LIAONING aircraft carrier (CV), after approximately six years of renovation work on the Ukrainian-built hull and one year of sea trials.

* The PLA Navy operates one nuclear ballistic missile submarine (SSBN)/submarine-launched ballistic missile (SLBM) weapon system with the XIA-class SSBN and the JL-1 SLBM. However, the status of this weapon system is unclear, and the U.S. Department of Defense does not consider it to be a credible threat. U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: May 2013), p. 6; U.S. Office of Naval Intelligence, *The People's Liberation Army: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), p. 23.

The prestige and political value of China's aircraft carrier program currently outweigh its military utility.¹⁶ Officially classified as a research and training vessel, the LIAONING CV will serve largely to build the PLA Navy's proficiency in aircraft carrier operations until the navy develops a carrier aviation capability in 2015 or later.¹⁷ A fully operational LIAONING CV with an attached air wing will allow Beijing to project more air power against less advanced navies in the region and improve the PLA Navy's ability to conduct a range of missions, including airborne early warning, command and control, and humanitarian assistance.¹⁸ China likely intends to follow the LIAONING CV with at least two domestically produced hulls,¹⁹ the first of which appears to be under construction at Shanghai's Changxing Island Shipyard.²⁰ This carrier could become operational before 2020.²¹

Submarine and Surface Forces

In 1990, the PLA Navy had large numbers of antiquated and low-capability submarines and coastal patrol boats. The PLA Navy since then has shed many of its legacy units and acquired – through a combination of indigenous development and Russian acquisition – more stealthy and lethal submarines and larger and more capable surface combatants. Thus, while the PLA Navy's total number of submarines and surface ships declined from 1990 to 2010, the force experienced significant qualitative improvements over this timeframe.

China continues to steadily increase its inventory of modern submarines and surface combatants, as well as large amphibious ships and logistics ships. China is building at least seven major classes of submarines and surface ships simultaneously, more than any other country in the world except for the United States.²²

- In 2012, China began building four “improved variants” of its SHANG nuclear attack submarine (SSN). China also continues production of the YUAN conventional submarine, some of which will include an air-independent power (AIP) system that allows for extended duration operations, and the JIN SSBN (discussed above). Furthermore, China is developing two new classes of nuclear submarines – the Type 095 guided-missile attack submarine (SSGN) and the Type 096 SSBN – and may jointly develop four advanced conventional submarines with Russia.²³ China's growing inventory of nuclear and conventional submarines will significantly enhance China's ability to strike opposing surface ships throughout the Western Pacific and to protect future nuclear deterrent patrols and aircraft carrier task groups.²⁴
- In 2012, China launched two new classes of naval combatants – the LUYANG III guided-missile destroyer (DDG) and the JIANGDAO corvette – and resumed construction of the LUYANG II DDG after a brief hiatus. China also continues serial production of the JIANGKAI II guided-missile frigate. Most of these units will be available by 2015. The PLA Navy's expanding and modernizing surface force will improve Beijing's ability to project power in the Taiwan Strait, East China Sea, South China Sea, and Western Pacific and to fulfill the PLA Navy's growing missions in China's distant seas, such as defense of distant maritime trade routes, humanitarian assistance, and counterpiracy.²⁵
- In 2012, the PLA Navy commissioned two new YUZHAO amphibious transport docks (LPD), bringing its total number of LPDs to three. The YUZHAO LPD can carry a mix of air-cushion landing craft, amphibious armored vehicles, helicopters, and marines. This provides the PLA Navy with enhanced flexibility for a range of missions, such as amphibious assault, humanitarian assistance, and counterpiracy. China may build additional YUZHAO LPDs and plans to introduce a new landing helicopter assault ship, called the Type 081, by 2018.²⁶

- In 2013, China added two upgraded FUCHI auxiliary replenishment oilers (AORs) to its fleet, bringing its total number of AORs from five to seven. The increased number of naval support ships better equips the PLA Navy's modern surface ships and future aircraft carriers with the means to sustain high-tempo operations at longer ranges.²⁷

According to China military analysts Andrew Erickson and Gabe Collins, "...by 2015, China will likely be second globally in numbers of large warships built and commissioned since the Cold War's end... by 2020, barring a U.S. naval renaissance, it is possible that China will become the world's leading military shipbuilder in terms of numbers of submarines, surface combatants and other naval surface vessels produced per year... [and] with respect to overall shipbuilding, China will likely reach 2013 Russian technical-proficiency levels by 2020 and may even reach 2013 U.S. technical levels by 2030."²⁸

Figure 1: *PLA Navy Submarine Orders-of-Battle 1990-2020, Total Numbers*

Type	1990	1995	2000	2005	2010	2015	2020
Diesel Attack	88	43	60	51	54	57-62	59-64
Nuclear Attack	4	5	5	6	6	6-8	6-9
Nuclear Ballistic	1	1	1	2	3	3-5	4-5
Total	93	49	66	59	63	66-75	69-78

Sources: Numbers from 1990 to 1995 are based on information from various editions of The International Institute for Strategic Studies, *The Military Balance*, reprinted in Anthony H. Cordesman et al., *Chinese Military Modernization and Force Development: A Western Perspective* (Washington, DC: Center for Strategic and International Studies, 2013), pp. 157-163. Numbers from 2000 to 2010 and projections for 2015 and 2020 were provided by the U.S. Office of Naval Intelligence. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013.

Figure 2: *PLA Navy Submarine Orders-of-Battle 1990-2020, Approximate Percent Modern**

Type	1990	1995	2000	2005	2010	2015	2020
Diesel Attack	0%	0%	7%	40%	50%	70%	75%
Nuclear Attack	0%	0%	0%	33%	33%	70%	100%

Sources: Approximate percentages from 1990 to 1995 are based on information from various editions of The International Institute for Strategic Studies, *The Military Balance*, reprinted in Anthony H. Cordesman et al., *Chinese Military Modernization and Force Development: A Western Perspective* (Washington, DC: Center for Strategic and International Studies, 2013), pp. 157-163. Approximate percentages from 2000 to 2010 and projections for 2015 and 2020 were provided by the U.S. Office of Naval Intelligence. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013.

* Modern submarines are those able to employ submarine-launched intercontinental ballistic missiles or antiship cruise missiles. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013.

Figure 3: PLA Navy Surface Orders-of-Battle 1990-2020, Total Numbers

Type	1990	1995	2000	2005	2010	2015	2020
Aircraft Carriers	0	0	0	0	0	1	1-2
Destroyers	19	18	21	21	25	28-32	30-34
Frigates	37	37	37	43	49	52-56	54-58
Corvettes	0	0	0	0	0	20-25	24-30
Amphibious Ships	58	50	60	43	55	53-55	50-55
Coastal Patrol (Missile)	215	217	100	51	85	85	85
Total	329	322	218	158	214	239-254	244-264

Sources: Numbers from 1990 to 1995 are based on information from various editions of The International Institute for Strategic Studies, *The Military Balance*, reprinted in Anthony H. Cordesman et al., *Chinese Military Modernization and Force Development: A Western Perspective* (Washington, DC: Center for Strategic and International Studies, 2013), pp. 157-163. Numbers from 2000 to 2010 and projections for 2015 and 2020 were provided by the U.S. Office of Naval Intelligence. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013.

Figure 4: PLA Navy Surface Orders-of-Battle 1990-2020, Approximate Percent Modern*

Type	1990	1995	2000	2005	2010	2015	2020
Destroyers	0%	5%	20%	40%	50%	70%	85%
Frigates	0%	8%	25%	35%	45%	70%	85%

Sources: Approximate percentages from 1990 to 1995 are based on information from various editions of The International Institute for Strategic Studies, *The Military Balance*, reprinted in Anthony H. Cordesman et al., *Chinese Military Modernization and Force Development: A Western Perspective* (Washington, DC: Center for Strategic and International Studies, 2013), pp. 157-163. Approximate percentages from 2000 to 2010 and projections for 2015 and 2020 were provided by the U.S. Office of Naval Intelligence. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013.

Maritime Law Enforcement Ships

China previously had six chief Maritime Law Enforcement (MLE) agencies, all with separate and sometimes overlapping missions. In June 2013, China officially consolidated four of these six agencies into the new China Coast Guard† in an effort to address longstanding shortcomings in its coordination of maritime policy and centralize control of China's MLE operations.²⁹

China's MLE agencies altogether operate approximately 110 ocean-going ships and 1,050 patrol craft and smaller boats.³⁰ While most of these ships previously were unarmed, those subordinated to the China Coast Guard under the new structure might now be authorized to carry light weapons.³¹ Furthermore, China's MLE force, like the PLA Navy, is in the midst of a modernization program and by 2015 will introduce at least 30 new ocean-going ships and more than 100 smaller patrol boats. Most of these units will be larger and more capable than previous ones, and some will

* Modern surface ships are those able to conduct multiple missions or that have been extensively upgraded since 1992. U.S. Office of Naval Intelligence, *PLA Navy Orders of Battle 2000-2020*, written response to request for information provided to the U.S.-China Economic and Security Review Commission, Suitland, MD, June 24, 2013.

† The former six chief MLE agencies were China Maritime Surveillance, Fisheries Law Enforcement Command, China Coast Guard, Maritime Customs Service, Maritime Safety Administration, and China Rescue and Salvage. China consolidated the assets of all but the Maritime Safety Administration and China Rescue and Salvage into the new China Coast Guard.

have the ability to embark helicopters. MLE agencies also will continue to acquire decommissioned ships from the PLA Navy – a practice that has increased in recent years.³²

China's expanding and modernizing MLE force will strengthen Beijing's ability to maintain robust presence patrols throughout China's claimed waters for extended periods. At the same time, it will free the PLA Navy's modern surface combatants to conduct missions farther from the Chinese mainland.³³

Personnel and Training Reforms

The PLA Navy over the last decade has implemented comprehensive institutional reforms designed to raise the quality of its personnel. Most important, the PLA Navy has streamlined its recruitment and retention policies and expanded the size and responsibilities of its noncommissioned officer corps. This has reduced the PLA Navy's reliance on volunteer conscripts, which historically had limited the availability of trained sailors for large portions of the year due to the stringent conscription induction and training cycle.³⁴ Largely due to this shift, the PLA Navy now is able to maintain higher day-to-day readiness rates and conduct longer-range and more frequent, robust, and realistic training. As these reforms continue, the PLA Navy gradually will become more proficient and confident operating its advanced weapons, platforms, and systems and conducting large-scale, sophisticated operations.³⁵

Implications for the United States

The PLA Navy's expanding role in military missions other than war and new willingness to operate in distant seas creates opportunities to enhance maritime cooperation between the United States and China, which could help to build trust between the two militaries and contribute to stronger bilateral ties. The United States and China already conducted their first and second bilateral counterpiracy exercises in September 2012 and August 2013, respectively. The two countries also agreed to hold a bilateral search and rescue exercise and their first bilateral humanitarian assistance and disaster relief exercise later in 2013. Furthermore, China accepted the U.S. offer to participate in the U.S.-led multilateral Rim of the Pacific exercise in 2014.³⁶

However, China's increasingly advanced and adaptive naval capabilities – many of which appear to be designed to restrict U.S. freedom of action throughout the Western Pacific – could undermine U.S. interests and security in the region. Beijing's ever improving anti-access/area denial capabilities raise the costs and risks to the United States for intervention in a potential regional conflict involving China and increase the operational and fiscal commitments required by the United States to maintain open and secure access to the maritime commons in the Western Pacific. Furthermore, the PLA Navy's rapidly advancing regional power projection capability likely boosts Beijing's confidence in its ability to assert its maritime claims in the East China Sea and South China Sea and to respond forcefully to perceived challenges by rival claimants. To protect and advance U.S. interests in Asia, it will be important for the United States to remain deeply engaged in the region and demonstrate that it has the capacity and resolve to actively shape – and offset – China's growing naval capabilities.

¹ Nan Li, "The Evolution of China's Naval Strategy and Capabilities: From 'Near Coast' and 'Near Seas' to 'Far Seas,'" in Phillip Saunders et al., eds., *The Chinese Navy: Expanding Capabilities, Evolving Roles* (Washington, DC: National Defense University Press, 2011), pp. 109-140; Office of Naval Intelligence, *The People's Liberation Army: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), pp. 5-6.

² U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: May 2013), p. 41; Andrew Erickson, "China's Modernization of Its Naval and Air Power Capabilities," in Ashley J. Tellis and Travis Tanner, eds., *Strategic Asia 2012-13: China's Military Challenge* (Seattle, WA, and Washington, DC: The National Bureau of Asia Research, 2012), pp. 63-67; Michael McDevitt, "The PLA Navy's Antiaccess Role in a Taiwan Contingency," in Phillip Saunders et al., eds., *The Chinese Navy: Expanding Capabilities, Evolving Roles* (Washington, DC: National Defense University Press, 2011), pp. 191-214; and Roger Cliff et al., *Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica, CA: RAND, 2007), pp. 3-12.

³ James Mulvenon, "Chairman Hu and the PLA's 'New Historic Missions,'" *China Leadership Monitor* (January 2009). <http://www.hoover.org/publications/china-leadership-monitor/3564>; Open Source Center, *Analysis: China – Media Highlight Noncombat Missions to Address Nontraditional Threats* (Washington, DC: October 16, 2008). OSC ID: FEA20081017785345. <http://www.opensource.gov>.

⁴ Andrew Erickson, "China's Modernization of Its Naval and Air Power Capabilities," in Ashley J. Tellis and Travis Tanner, eds., *Strategic Asia 2012-13: China's Military Challenge* (Seattle, WA, and Washington, DC: The National Bureau of Asia Research, 2012), pp. 60-125; Daniel Hartnett and Frederic Vellucci, "Toward a Maritime Security Strategy: An Analysis of Chinese Views Since the Early 1990s," in Phillip C. Saunders et al., eds., *The Chinese Navy: Expanding Capabilities, Evolving Roles* (Washington, DC: National Defense University Press, 2011), pp. 81-108; Thomas Bickford, *Uncertain Waters: Thinking About China's Emergence as a Maritime Power* (Alexandria, VA: Center for Naval Analyses, September 2011), pp. 20-28; and U.S. Office of Naval Intelligence, *The People's Liberation Army: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), pp. 5-11.

⁵ U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: 2013), pp. I, 31-33; Andrew Erickson and Gabe Collins, "Near Seas 'Anti-Navy' Capabilities, not Nascent Blue Water Fleet, Constitute China's Core Challenge to U.S. and Regional Militaries," *China SignPost*, March 6, 2012. <http://www.andrewerickson.com/2012/03/china-signpost-55-near-seas-anti-navy-capabilities-not-nascent-blue-water-fleet-constitute-chinas-core-challenge-to-us-and-regional-militaries/>; Thomas Bickford, *Uncertain Waters: Thinking About China's Emergence as a Maritime Power* (Alexandria, VA: Center for Naval Analyses, September 2011), pp. 28-29; Toshi Yoshihara and James Holmes, *Red Star Over the Pacific: China's Rise and the Challenge to U.S. Maritime Strategy* (Annapolis, MD: Naval Institute Press, 2010), pp. 14-44; U.S. Office of Naval Intelligence, *The People's Liberation Army: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), pp. 5-10; and Roger Cliff et al., *Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica, CA: RAND, 2007), pp. 3-12. http://www.rand.org/content/dam/rand/pubs/monographs/2007/RAND_MG524.pdf.

⁶ Jonathan Greenert and Mark Welsh, "Breaking the Kill Chain," *Foreign Policy*, May 16, 2013. http://www.foreignpolicy.com/articles/2013/05/16/breaking_the_kill_chain_air_sea_battle?page=full; U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: 2013), pp. I, 31-33; and Anton Lee Wishik II, "An Anti-Access Approximation: The PLA's Active Strategic Counterattacks on Exterior Lines," *China Security* 19 (2011).

⁷ Andrew Erickson and Gabe Collins, "China's Real Blue Water Navy," *Diplomat*, August 30, 2012. <http://thediplomat.com/2012/08/30/chinas-not-so-scary-navy/?all=true>; U.S. Department of Defense, *Military and Security Developments Involving the People's Republic of China 2011* (Washington, DC: 2011), p. 61; Thomas Bickford, *Uncertain Waters: Thinking About China's Emergence as a Maritime Power* (Alexandria, VA: Center for Naval Analyses, September 2011), pp. 27-31; Michael McDevitt and Frederic Vellucci, "Two Vectors, One Navy," *Proceedings* 137:4 (April 2011). <http://www.usni.org/magazines/proceedings/2011-04/two-vectors-one-navy>; and U.S. Office of Naval Intelligence, *The People's Liberation Army Navy: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), p. 6.

⁸ Shane Bilsborough, "China's Emerging C4ISR Revolution," *Diplomat*, August 13, 2013. <http://thediplomat.com/2013/08/13/chinas-emerging-c4isr-revolution/?all=true>; Kimberly Hsu, *China's*

Military Unmanned Aerial Vehicle Industry (Washington, DC: U.S.-China Economic and Security Review Commission, June 13, 2013); Mark Stokes, Jenny Lin, and L.C. Russell, *The Chinese People's Liberation Army Signals Intelligence and Cyber Reconnaissance Infrastructure* (Arlington, VA: The Project 2049 Institute, November 11, 2012); and Mark Stokes, *China's Evolving Space Capabilities: Implications for U.S. Interests* (Arlington, VA: The Project 2049 Institute, April 26, 2012).

⁹ Andrew Erickson, "How China Got There: Beijing's Unique Path to ASBM Development and Deployment," *China Brief* 13.12 (June 7, 2013).

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¹⁰ Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities – Background and Issues for Congress* (Washington, DC: Congressional Research Service, July 5, 2013), pp. 3-38; U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: 2013), p. 42; U.S. Office of Naval Intelligence, *The People's Liberation Army: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), pp. 18-28; and Anthony H. Cordesman and Martin Kleiber, *Chinese Military Modernization: Force Development and Strategic Capabilities* (Washington, DC: Center for Strategic and International Studies, April 2007), p. 132.

¹¹ U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: May 2013), pp. 6-7; Michael Cole, "China's Growing Long-Range Strike Capability," *Diplomat*, August 13, 2012.

<http://thediplomat.com/flashpoints-blog/2012/08/13/chinas-growing-long-range-strike-capability/>.

¹² U.S. Department of Defense, *Annual Report to Congress on China's Military Power, Military and Security Developments Involving the People's Republic of China 2013* (Washington, DC: 2013), p. 31.

¹³ U.S. Office of Naval Intelligence, *The People's Liberation Army: A Modern Navy with Chinese Characteristics* (Suitland, MD: 2009), p. 23.

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