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Surging Second Sea Force: China's Maritime Law-Enforcement Forces, Capabilities, and Future in the Gray Zone and Beyond

Andrew S. Erickson

Joshua Hickey

Henry Holst

SURGING SECOND SEA FORCE

China's Maritime Law-Enforcement Forces, Capabilities, and Future in the Gray Zone and Beyond

Andrew S. Erickson, Joshua Hickey, and Henry Holst

China's armed forces are divided into three major organizations, each of which has a maritime subcomponent. The gray-hulled People's Liberation Army Navy (PLAN) claims a growing portion of the PLA's personnel and resources; the People's Armed Police (PAP) leads, and increasingly reflects the paramilitary character of, China's white-hulled maritime law-enforcement (MLE) forces, including the China Coast Guard (CCG); and the militia contains a growing proportion of sea-based units, the blue-hulled, PLA-controlled People's Armed Forces Maritime Militia (PAFMM). Each of China's three sea services is the world's largest in terms of ship numbers. Unlike America's military-focused shipbuilding industry, China's massive commercial shipbuilding industry subsidizes overhead costs for construction of all three sea forces' vessels. That explains in part how China has been able to build and modernize all three services so expeditiously, none more rapidly than its second sea force, centered on the consolidating CCG. Using a platform-based approach that spans ongoing organizational changes, complexity, and overlap, this article assesses these vessels, their order of battle, and their capabilities, as well as likely future trends and implications.[1]

Over the past decade-plus, China has undertaken a massive MLE modernization program that has increased greatly its capability to operate MLE vessels in remote areas. A key contributor to near-seas maritime operations to further disputed sovereignty claims in the "gray zone" between peace and war, these CCG-centered MLE forces afford Beijing increasing influence over the regional maritime situation without the direct use of PLAN warships, demonstrating power while reducing the risk of escalation and allowing the PLAN to focus on other, more "naval" missions farther afield.[2]

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This build-out has yielded Beijing a formidable "second navy."[3] Today China boasts not only the world's largest navy but also the world's largest maritime law-enforcement fleet—by a sizable margin. As of 2017, China's 17,000-plus CCG personnel crewed 225 ships of over five hundred tons capable of operating offshore, and at least another 1,050 vessels confined to closer waters, for a total of over 1,275—more hulls than the coast guards of all its regional neighbors combined.[4] At more than ten thousand tons full load each, its two Zhaotou-class patrol ships are the world's largest MLE ships.

China is applying lessons learned from the U.S. and Japanese coast guards as well as indigenous experience, including the incorporation of new ship features such as helicopters, interceptor boats, deck guns, and high-capacity water cannon. Most recently constructed CCG ships now have high-output water cannon mounted high on their superstructures. The 2014 *Haiyang Shiyou (HYSY) 981* oil rig standoff demonstrated their ability to inflict damage by breaking pilothouse windows, damaging bridge-mounted equipment, forcing water down exhaust funnels, and breaking bones of crewmembers on Vietnamese vessels. Many new CCG ships have quick-launch boat ramps astern, allowing for rapid deployment of interceptor boats.

China's MLE buildup is slowing, but far from over; in 2020, China's coast guard is expected to have 260 ships capable of operating offshore.[5] Many are capable of operating anywhere in the world.[6] Numbers of small craft are not expected to change significantly; we estimate that the CCG will continue to own at least another 1,050 smaller vessels confined to closer waters, for a total of more than 1,300 hulls. From 2005 to 2020, this represents overall a fifteen-year net increase of four hundred total coast guard ships, among them 202 additional ships capable

TABLE 1
CHINA COAST GUARD FORCE LEVELS (2005–20)

Type (tonnage)	2005	2010	2017	2020	15-Year Net Increase
Oceangoing patrol ships (2,500–10,000)	3	5	55	60	+57
Regional patrol ships (1,000–2,499)	25	30	70	80	+55
Regional patrol combatants (500–999)	30	65	100	120	+90
Subtotal: Ships that can operate offshore	*58*	*100*	*225*	*260*	*+202 (+350%)*
Coastal patrol craft (100–499)	350	400	450	450	+100 (approx.)
Inshore patrol boats / minor craft (<100)*	500+	500+	600+	600+	+100 (approx.)
Total: All China Coast Guard	**900+**	**1,000+**	**1,275+**	**1,300+**	**+400 (approx.)**

Note:
* There are forty-ton interceptor boats stationed on at least one (probably all) of China's offshore islands. With forward basing available in the South China Sea disputed areas, size is less relevant than it was previously.

of operating offshore, representing 350 percent growth in that category. As table 1 indicates, all types of CCG ships have increased in numbers, with the most significant force-level increases, proportionately, occurring in oceangoing patrol ships (those over 2,500 tons).

FOUNDATION

China's MLE modernization program has proceeded in three major phases, the latter two of which overlap. Phase 1 (2000–10) focused on modest, dual-role research and patrol ships. These were relatively small (mostly 1,000–1,750 tons, with several larger ships) and generally unarmed. Only a few had helicopter facilities. Phase 2 (2010–17) yielded dozens of new purpose-built offshore patrol ships. Much larger than phase 1 vessels (three thousand to ten thousand tons full load), these ships featured improved sea keeping and endurance, as well as more-advanced (military-style) electronic systems. Internet photographs indicate that all CCG ships built within the last five years have a datalink antenna (such as the HN-900), similar to those on PLAN vessels and to the U.S. Navy's Link 11; older CCG ships now are being retrofitted with such antennae. Most vessels have helicopter decks, some with hangars. Some ships have high-pressure water cannon and ten-meter-long fast-interceptor boats with twin outboard engines enabling a thirty-five-knot top speed, well suited for dispatch to land features for local security operations. Most new ships built in phase 2 have 30 to 76 mm guns. Phase 3 (2014–18) backfilled with coastal law-enforcement units, primarily dozens of modern, capable, fast patrol combatants with guns, oriented toward traditional law-enforcement functions. Several medium-sized patrol ships were built to provide command and control.

In 2013, China consolidated four of its five major maritime law-enforcement agencies (the "five dragons") into a new agency called the CCG. The four dragons thus consolidated are the former State Oceanic Administration (SOA) and its subordinate China Marine Surveillance (CMS); the former Maritime Police and Border Control, previously administered by the Ministry of Public Security; the former Fisheries Law Enforcement (FLE), previously administered by the Ministry of Agriculture; and the former Maritime Anti-smuggling Police, previously administered by the General Administration of Customs (GAC). Only one major MLE agency remains independent of the CCG: the Maritime Safety Administration (MSA). Another non-CCG organization, China Rescue and Salvage (CRS), plays a supporting non-MLE role. The latter two will be discussed briefly just before the conclusion of the article.

More than twenty naval and commercial shipyards have produced CCG vessels over the past decade. With overhead costs reduced by a strong commercial shipbuilding industry, construction of coast guard and other MLE vessels is both

cheap and efficient. Use of commercial, off-the-shelf drivetrains and electronics, combined with a lack of complex combat systems, facilitates rapid assembly, with multiple units built simultaneously. According to contract and media details, typical total construction time (from start to commissioning) is twelve to eighteen months for a large (over one thousand tons) patrol ship (designated WPS) and nine to twelve months for a smaller (under one thousand tons) patrol craft (WPC) or patrol combatant (WPG).

By 1999, China had made a national-level decision to start expanding and modernizing its MLE agencies.[7] The majority of the shipbuilding budget was allocated to the organization then known as CMS, primarily responsible for enforcing Chinese maritime territorial claims and conducting offshore law enforcement.[8] Prior to the turn of the century, the CMS force consisted primarily of a limited number of 1970s-built dual-use patrol and research ships, most of which were relatively small and intended for operations in near-coastal areas. None of these ships was configured specifically for law-enforcement duties, as no guns, helicopters, fast-interceptor boats, water cannon, or other MLE equipment was fitted.[9]

Unlike America's military-focused shipbuilding industry, China's massive commercial shipbuilding industry subsidizes overhead costs for construction of all three sea forces' vessels. . . . China has been able to build and modernize all three . . . expeditiously, none more rapidly than . . . the consolidating China Coast Guard.

Initially, the CMS ship-modernization program focused on the acquisition of dual-use ships of several sizes that could perform patrol and surveillance duties, as well as limited research and survey activities. This initial acquisition program began in earnest in 2004, with most new ships launched and commissioned by the end of 2005. CMS received three Shuyou-class "1,000-ton" patrol ships (1,428 tons full load), three Shuwu-class "1,500-ton" patrol ships (1,740 tons full load), and the first Shucha I "3,000-ton" patrol ship (4,000 tons full load), which were distributed relatively evenly among the three CMS branches (North, East, and South). Typical of earlier dual-use patrol ships (known colloquially as "WAGORs"), all three classes were fitted with stern A-frames and cranes to enable them to handle hydrographic and oceanographic research equipment, although few ever have been seen performing such roles.[10] Significantly, the Shucha I class was fitted with a helicopter landing deck and hangar facilities—not previously fitted to any CMS ships—giving the first indication that CMS intended to perform offshore missions requiring helicopter support. However, in keeping with the missions of SOA and CMS—stated publicly as being primarily

scientific—none of these new ships was armed with any permanent weapons.[11] Central to the CMS ship buildup was the thirty-six-hull program that began in 2010. Supplied to provincial and municipal MLE organizations, these ships displaced six hundred to 1,500 tons.

China's other maritime law-enforcement agencies, which historically only had limited offshore roles and capabilities, began to acquire a small number of ships capable of operating offshore. By 2007, the PAP Maritime Police acquired its first large patrol ship, the Haixun II class's solitary vessel, *Zhong Guo Hai Jing 1001* (now known as *Hai Jing 31101*). Historically, the PAP Maritime Police had operated only small, fast, heavily armed patrol craft in support of its primary responsibilities of border defense, antismuggling efforts, and immigration enforcement (as well as regime security). *Hai Jing 31101* was equipped with a 37 mm main gun and a helicopter deck. It had more than four times the displacement of most PAP Maritime Police patrol craft, and its restricted initial operations revealed the PAP Maritime Police's discomfort with operating larger ships; most PAP Maritime Police patrol craft crewmen were drawn from land-based defense forces rather than maritime backgrounds. The PAP thus had difficulty adapting to the twenty-four-hour cycle of activity that is required when a ship goes out for days or weeks at a time; this was not part of its organizational culture.[12] For most of its early career, *Hai Jing 31101* rarely ventured beyond coastal waters. It was seen largely as a ceremonial "status" platform for the PAP Maritime Police, although in recent years under the CCG it has played a slightly more active offshore role.

The Bureau of Fisheries oversaw China Fisheries Law Enforcement, which already operated several dozen aging offshore patrol ships used for resource protection and fisheries enforcement. FLE began its own modest modernization program in the first few years of the new century. This consisted mostly of introducing new coastal patrol craft classes, but culminated in the construction of the then-impressive Zhongyang-class patrol ship *Zhong Guo Yu Zheng 310,* which was launched in 2010.[13] As with other MLE agencies' recent acquisitions, FLE chose to equip WPS 310 with a helicopter deck and hangar—even though FLE did not actually own any helicopters. In its initial years, FLE used WPS 310 extensively for offshore patrol duties, and in later years the ship would serve as a proof of concept for at least one follow-on class that now forms the backbone of the FLE fleet.

Early in the first decade of the twenty-first century, the fourth major maritime law-enforcement agency, GAC, had just finished building over thirty new two-hundred-ton patrol craft (of the Hailin I and II classes) for coastal countersmuggling operations. It did not have a significant ship-construction program ongoing after about 2003.

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MSA continued its own construction program, acquiring a variety of ships to fulfill its specialized missions, ranging across buoy tending, environmental cleanup, search and rescue, light maritime towing and salvage, and port operations. MSA also acquired several large patrol ships that were able to respond to offshore maritime disasters and emergencies and interact with major coast guard organizations from other Pacific countries. MSA was the first of the five dragons to obtain purpose-built patrol ships large enough for transoceanic operations, with the two Shubian-class ships attending joint exercises in Hawaii and other distant locales. Unlike China's other MLE agencies, MSA consistently has maintained a close working relationship with the U.S. Coast Guard, the Japan Coast Guard, and other regional MLE organizations.[14] Unlike the other dragons, MSA historically has acquired a large portion of its funding from collection of port fees from commercial shipping, allowing it some degree of budget autonomy and insulation from the country's leadership and national budget issues.[15]

MOVING FORWARD: CHINA'S NEW COAST GUARD

As previously noted, 2013 saw the integration (at least on paper) of four of these agencies into a new agency called the China Coast Guard. This reform had been anticipated for several years by the individual agencies, several of which apparently began aggressive construction programs after 2010, perhaps in an attempt to assert dominance within the new organization's command structure.[16] There was little cooperation, with each organization (particularly FLE and CMS) apparently focusing on its own ship designs.

Shortly before CCG integration, the CMS force also acquired several auxiliary ships that recently had been retired from PLAN service. These transfers likely were intended to fill gaps in patrol capabilities as China began to pursue maritime expansion more assertively in the South and East China Seas. The vessels included three former intelligence-collection ships (the icebreaking Yanbing-class former AGI 723, the *Xiang Yang Hong 9*–class former AGI 852, and the Haiyang-class former AGI 411), as well as a few other old PLAN auxiliaries, including a converted cable layer, a minelayer, and three large ocean salvage tugs. The former PLAN ships were pressed into service immediately (largely without naval guns and electronics), while the ship-construction program of CMS—a leading component of the soon-to-be CCG—proceeded.[17]

One hallmark of CCG modernization in recent years has been the clear specialization of ships and craft toward particular missions, an outcome of procurement programs initiated in the era of the five dragons.[18] Moreover, China's massive shipbuilding industry (and, presumably, shipbuilding budget) has allowed the CCG to focus on a variety of designs oriented toward specific requirements, rather than building jack-of-all-trades ships that were more flexible but less

capable of specific functions. However, all these ships and craft remain highly capable of acting in other roles, particularly those related to promoting sovereignty in disputed South and East China Sea areas.

A second hallmark of CCG modernization is a preference for evolutionary design modifications. Since 2010, various initial designs have been followed by frequent revisions in configurations and capabilities. For instance, China has made four sequential variations of its "regional thousand-ton" patrol-ship design since the program started almost a decade ago. The original variant (the Shuyou class) was essentially a dual-purpose research and patrol ship for CMS. It was equipped with A-frames and cranes at the fantail to accommodate survey activities. As the design progressed to the Shuke I, II, and III classes, the ships clearly evolved toward a law-enforcement role, with cranes and A-frames removed; davits for small, fast boats added; and hull and superstructure modifications made to allow them to handle open-water operations better.

Similar upgrades have been made in other classes. These changes were both a result of close observation of other modern MLE ships (primarily those operated by the U.S. Coast Guard and Japan Coast Guard) and lessons learned by CMS, FLE, and other CCG agency ships operating farther offshore for longer periods.

MARITIME CUSTOMS AND ANTISMUGGLING

The segment of the CCG that performs maritime customs enforcement (formerly GAC) has been active in acquisitions in recent years, replacing most of its 1980s/1990s-built fleet of small patrol craft with three new classes of ships intended specifically for maritime law-enforcement and customs duties. The new Zhaogao-class patrol ship, of which three were built, gives the CCG additional capability for exclusive economic zone (EEZ) patrol activities, such as intercepting smugglers farther offshore. The 1,750-ton ship is 308 feet long and thirty-nine feet in beam. Unlike most CCG patrol ships, which have maximum speeds of just over twenty knots, the Zhaogao design has four powerful diesel engines that likely allow it to reach top speeds of nearly thirty knots, with a range of five thousand nautical miles (nm) at fifteen knots.[19] These ships also are equipped with two quick-launch davits for fast-interceptor boats that can be deployed while under way. The ships are fitted with a 30 mm automatic main gun and a helicopter deck.

A second specialty class, the Hutao I patrol combatant, is configured for extended patrols deep into China's EEZ. Like the Zhaogao, the Hutao I is fitted with four diesels providing a full-power speed of over thirty knots via four shafts and propellers, and a range of five thousand nautical miles at fifteen knots. The 625-ton Hutao I measures 223 feet long and 28.5 feet in beam. It has dual quick-launch stern ramps, allowing it to launch and recover fast-interceptor boats while under way, and is armed with a single 30 mm gun, two smaller guns, and water

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TABLE 2
CHINA COAST GUARD MARITIME CUSTOMS: NOTABLE CLASSES

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Guns (millimeters)
Zhaogao WPS	3	(Hai Jing) 33103 (Zhejiang), 44104 (Guangdong), 46014 (Hainan)	308	1,750	30
Hutao I WPG	8 (3+ new units)	(Hai Jing) 31101, 31103, 33104, 35104, 44105, 44106, 45103 + more	223	625	30
Hutao III WPG	2	44109, 44110	223	625	30
Haihei WPC	2	(Hai Guan) 905 + another	205	450	37
Haifeng WPC	5	(Hai Guan) 900–904	190	440	14.5
Hulai II WPC	15 (+ new units)	(Hai Jing) 33004, 35007, 37001, 44005, 44008, 44015–18, 44020, 44021, 45001, 45002, 46003 + more	177	330	14.5
Hailin I WPC	25+	(Hai Jing) 44059, 44068, 44069; (Hai Guan) 853–80 (pennant numbers probably changed)	170	230	23, 14.5
Hailin II WPC	10+	(Hai Jing) 21091, 31088, 33086, 35089; (Hai Guan) 881–90 (pennant numbers probably changed)	170	230	23
Type 611 WPC	~10	(Hai Jing) 33028; (Hai Guan) 823–30 (pennant numbers probably changed)	145	170	14.5
Haigao WPC	10+	(Hai Guan) 810–20 (pennant numbers probably changed)	140	100	14.5

Notes:
WPC = coast guard patrol craft; WPG = coast guard patrol gunboat; WPS = coast guard patrol ship.
The China Coast Guard overall has several hundred classes of ships; to keep this and subsequent tables manageable, only the most significant classes are included.

cannon. At least eight Hutao Is are operational already, and additional units continue to be built.

A third class, the Hulai II, is cosmetically similar to the ubiquitous Dutch Damen Stan Patrol 4207, a patrol craft operated by over a dozen navies and coast guards internationally. However, the Hulai II adds a third engine, once again giving it a top speed of over thirty knots, for missions inside China's EEZ, particularly maritime customs interdiction, and a range of 1,200 nm at eighteen knots. The 330-ton Hulai II is 177 feet long and twenty-four feet in beam, and also is

equipped with a fast-launch stern-ramp system, allowing it to deploy its interceptor boat while under way. It has small arms and a smoke grenade launcher, high-capacity water cannon, and reinforced hull rub rails. In recent years, variations of both the Hutao I and the Hulai II designs have been sold to export customers (the latter to Pakistan), indicating that these are competitive, effective designs in a crowded international patrol craft market. Over a dozen Hulai IIs have been built in the last few years, and as many as thirty total units may be built to replace the CCG's older Type 611– and Hailin I/II–class patrol craft built in the 1980s and '90s.[20]

LONG-RANGE FISHERIES ENFORCEMENT

Fisheries enforcement and other resource protection in furtherance of China's territorial claims always has been a primary mission of China's maritime agencies, specifically the former FLE. FLE's progressive integration into the CCG likely improved the budgetary situation for the former, which to execute its mission historically had relied on a jumble of older, less-capable patrol ships, a hodgepodge of patrol craft, and assorted converted fishing boats. Over the past decade the CCG's former Fisheries Enforcement Branch embarked on an active program to replace and modernize its entire fleet.

Most notable with regard to long-distance fisheries enforcement is the new Zhaoyu-class large patrol ship, of which a dozen were commissioned from 2014 to 2016. At 360 feet long and forty-six feet in beam, the 3,500-ton Zhaoyus have a traditional combatant-style hull optimized for long-distance cruising in heavy seas, as these ships are intended for operations well outside China's disputed maritime periphery—in theory, anywhere.[21] This class has an estimated top speed of twenty-five knots, with a range of 7,500 nm at fourteen knots. Design modifications were based on lessons learned from FLE's former flagship, the one-off Zhongyang-class patrol ship *Zhong Guo Yu Zheng 310,* which recently was transferred to the Sansha City municipality. FLE likely identified some design and stability flaws in the ship, and subsequently improved the Zhaoyu configuration by reducing the superstructure by one deck (for roll stability) and adding a stern-launch boat ramp to deploy interceptor and boarding craft from beneath the helicopter deck. Additional fittings include a helicopter hangar and a substantial armament of one single 30 mm gun and four single automatic 12.7 mm guns.[22]

New to this category is the Zhaochang patrol ship, purpose-built for long-distance fisheries enforcement with a new tumblehome hull design and a 30 mm gun.[23] The 3,500-ton ship is 360 feet long and forty-nine feet in beam. A proof of concept for the CCG's first ship with electric-drive propulsion, complete with diesel generators, the sole Zhaochang built to date yields a top speed of only twenty knots, but has a long range: ten thousand nautical miles at fifteen knots.

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TABLE 3
CHINA COAST GUARD FISHERIES ENFORCEMENT ORDER OF BATTLE (SELECTED)

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Gun(s) (millimeters)
Zhaochang WPS	1	(Hai Jing) 2301	360	3,500	30
Zhaoyu WPS	12	(Hai Jing) 1301–1304, 2302–2304, 3301–3305, 46305	360	3,500	30
Zhaotim WPS	14–15	(Hai Jing) 1102–1104, 3104–3106, 21115, 31115, 33115, 35115, 37115, 46115; (Yu Zheng) 45005, 45013, 45036	269	1,764	30
Dalang I WPS (ex-PLAN)	1	(Hai Jing) 3411	370	4,500	30
Zhongeng WPS	10+	(Yu Zheng) 13001, 32501, 33001, 33006, 35001, 37008, 44061, 45001, 46012 + more	180	~1,000	14.5
Zhongwen WPS	1	(Yu Zheng) 21103	195	850	unknown
Zhongke WPG	6+	(Yu Zheng) 21101, 21111, 27061, 33018, 33205, 45002 + possibly more	180	~500	unknown
Zhongem WPG	2	(Yu Zheng) 37361	190	550	14.5
Zhongtao WPC	50+	(Yu Zheng) 12002, 21006, 21009, 21137, 21202, 21401, 32511, 32521, 32528, 32543, 32545, 33012, 33015–19, 33023, 33025, 33129, 33316, 33416, 33417, 37001, 37005, 37015, 37529, 37601, 45012, 46013 + more	160–70	300–450	14.5
Zhongsui WPC	6	(Yu Zheng) 35199, 44601–603, 44606, 45003	165	~350	14.5
Duancude WPC	10+	(Yu Zheng) 21402, 31006, 37057, 37206, 37518 + more	130	~200	none
Nanhua Type A WPC	~10	(Yu Zheng) 44025, 44081, 44121, 44168; (Hai Jian) 9040, 9060 (additional units operated by China MSA and PLA MTS)	110	150	23
Zhongbong WPC	10+	(Yu Zheng) 13203, 13301, 32511, 37078, 37163, 37606, 37607	100–20	~150	none
Fisheries patrol trawlers	30+	(Yu Zheng) variety of designs and numbers	100–20	250–600	none, generally
Red Arrow WPB	50+	4-digit, ending in *H*	40	15	none

Notes:
MSA = Maritime Safety Administration; MTS = Maritime Transport Squadron (Army Logistics); PLA = People's Liberation Army; PLAN = People's Liberation Army Navy; WPB = coast guard patrol boat; WPC = coast guard patrol craft; WPG = coast guard patrol gunboat; WPS = coast guard patrol ship.
The six classes at the bottom of the table (beginning with the Zhongsui WPC), while relatively small in tonnage, are deployable to Chinese-occupied features in the South China Sea, and may well be used thus.

For regional fisheries-enforcement operations—particularly in disputed fisheries areas adjacent to Vietnam (e.g., the Gulf of Tonkin), Japan, and the Koreas—the CCG built a large class of smaller patrol ships, the Zhaotim class. The fourteen or fifteen 269-foot-long, thirty-nine-foot-beam, 1,764-ton ships in this class are optimized for regional, medium-endurance patrols, with a reported 7,500-mile range at thirteen knots, an ice-strengthened hull (for operations in the northern Bo Hai [formerly known as the Gulf of Chihli]), a 30 mm gun, two small fast-interceptor boats, and a moderate towing capability to assist disabled fishing boats. With their regional, near-shore focus, Zhaotims lack helicopter facilities. The relatively beamy, low-slung hull design, with bulbous bow, indicates that sea keeping in heavy weather and efficiency were key design factors, rather than the high speed and maneuverability prioritized in other CCG ships intended for interdiction duties. (Fishing boats, typically low speed, cannot outrun even patrol ships whose top speed does not exceed twenty knots, such as the Zhaotim class.)

Provincial-level fisheries law-enforcement agencies also have undertaken a major modernization program. As late as the 1990s, PRC coastal fisheries enforcement predominantly was performed by converted fishing boats and various older patrol craft. However, in the last decade local forces have built about a dozen different designs of thirty-five-to-sixty-meter coastal patrol craft and combatants for more-local, short-endurance enforcement duties. Most notably, the fifty-meter, 450-ton Zhongtao class has been in constant production since the early years of this century, with over fifty units built at six shipyards to date.

All units share a common hull and basic superstructure design, but vary significantly in how they are fitted out topside, depending on operational location and typical weather conditions. For operational areas where assertive fishermen may use collisions and shouldering as a defense against enforcement (e.g., the Gulf of Tonkin), Zhongtao units have reinforced ribbing along the hulls. For operational areas with heavier sea conditions (e.g., the East China Sea), Zhongtao units may have raised bow bulwarks. Some units stationed in the Yellow Sea and Bo Hai may have ice-strengthened bows. Earlier units used small, davit-launched interceptor boats, while later units have a stern gate and quick-launch ramp. The Zhongtao class is yet another example of coast guard designers adapting and learning operational lessons when building new ships and patrol craft.

OFFSHORE SURVEILLANCE, PATROL, AND SOVEREIGNTY ENFORCEMENT

While the CCG in its entirety has a general role of performing offshore surveillance and patrol (particularly with its larger patrol ships), as well as border defense and territorial enforcement, historically these roles were played primarily by two former dragons: CMS and the PAP Maritime Police. CMS was primarily

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responsible for offshore duties, with much of its force composed of larger ships capable of longer-endurance operations and dual hatted as oceanographic research ships.

As a component of the well-funded SOA, CMS substantially bolstered its new shipbuilding programs during and after the consolidation with orders for several new classes of large ships (most of which eventually were commissioned into the now-consolidated CCG). New CMS ships clearly were built with a primary role of open-seas, long-term patrol and surveillance duties, and were less equipped for law-enforcement interception, fisheries administration, oceanographic research, or safety of life at sea (SOLAS) roles than CCG ships built prior to 2012.[24]

CCG-centered MLE forces afford Beijing increasing influence over the regional maritime situation without the direct use of PLAN warships, demonstrating power while reducing the risk of escalation.

The most notable of the new ships built for the CCG in recent years were the two massive Zhaotou-class flagships, one each based in the south and the east. The Zhaotous have received an inordinate amount of media attention owing to their great size: with a length of 165 meters (541 feet), a beam of more than twenty meters (over sixty-five feet), and a full load of more than ten thousand tons, their displacement is greater than that of modern naval destroyers. Their estimated speed is twenty-five knots, their range 15,000 nm.

However, the substantive rationale for construction of these ships is unclear, as they do not offer any technical advantages vis-à-vis other, smaller, patrol ships built recently for the CCG.[25] There are Internet rumors that the ships were ordered in direct response to Japan's deployment of its 9,500-ton *Shikishima*-class cutters to the Senkakus in 2013, which at the time dwarfed any ships in the CCG inventory, suggesting that construction of the Zhaotou class represents a point of pride for China—to have the world's largest coast guard ships—rather than an actual capability requirement. While that rationale is speculative at best, the Zhaotou design nonetheless does provide the CCG with a large platform that can operate anywhere in the world with maximum endurance, while carrying a helicopter and mounting a 76 mm main gun. It is unlikely that any additional units of this class will be built, however, owing to the ship's berthing requirements and the presumably higher cost of operations without any tangible benefit in capability compared with smaller CCG patrol ships.[26]

Since consolidation, the CCG's three most effective new classes of large patrol ships have been the Shucha II, Shuoshi II, and Zhaolai classes, all of which are based on earlier classes that were operational before the CCG reform. The Shucha II, of which ten units are currently operational, is based on the Shucha I design

originally built for CMS early in the new century. When built, the Shucha I was the most modern ship in the CMS inventory, combining long-distance endurance with a substantial ability to perform oceanographic research. The Shucha II improved on this design and oriented the mission strictly toward patrol activities by eliminating the survey handling equipment and stern A-frame, replacing them with a larger helicopter deck and launch facilities for small interceptor boats. The Shucha II, like its predecessor, is equipped with a hybrid diesel-electric power plant—providing good cruising efficiency and range—and a drivetrain that uses steerable electric propulsor pods—giving it excellent maneuverability. Moreover, Shucha II has positions available for installation of 30 mm main guns in the future, if required.[27]

Arguably comprising the most capable and versatile class in the CCG, the four Shuoshi II–class units are based on MSA's flagship *Hai Xun 01,* built several years earlier. With a length of 130 m and beam of 16 m (fifty-two feet) and a 5,800-ton displacement, it is similar in overall size and design to the U.S. Coast Guard's Legend-class National Security Cutter. The Shuoshi II design is configured for long-distance open-ocean operations in any weather conditions. It is fitted with high-capacity water cannon and a helicopter landing deck and hangar, and has design provisions for the future fitting of a 76 mm gun. However, unlike that of many other large, purpose-built patrol ships the CCG operates, a Shuoshi II's aft area is considered a "working stern," capable of performing light rescue and salvage operations and moderate towing of ships at sea, giving this class a well-rounded capability that is not limited to law-enforcement operations. While it remains unclear whether additional hulls will be built, this is one of the world's most capable, versatile MLE vessels.[28]

The Zhaolai-class patrol ship likely was an off-the-shelf design intended to provide the capability quickly to interact with Japanese and Vietnamese vessels in the Senkakus and the South China Sea. The Zhaolai is based closely on the CRS Hai Jiu 111–class salvage and rescue ship, giving it a heavy-duty hull, a powerful engineering plant, and the ability to operate in even the worst sea and weather conditions. The 4,800-ton Zhaolai design eliminated the large salvage cranes present on the CRS variant and added davits for small interceptor boats. Each of the CCG's four Zhaolais also is equipped with a helicopter landing deck and has a mount position forward for a 76 mm gun, should the CCG desire to backfit the ship with one. Among CCG ships, the Zhaolai is configured best for heavy towing and shouldering of other ships, and its large, high-mounted water cannon can be used both for firefighting and for dousing smaller foreign ships during close-in, nonkinetic dissuasion operations. As the Zhaolai was initially an off-the-shelf stopgap solution to CCG capability shortfalls and is inferior to more-specialized designs, it is unlikely that additional units will be built.[29]

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TABLE 4
CHINA COAST GUARD OFFSHORE SURVEILLANCE, PATROL, AND SOVEREIGNTY-ENFORCEMENT ORDER OF BATTLE (SELECTED)

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Guns (millimeters)
Zhaotou WPS	2	(Hai Jing) 2901, 3901	541	10,000+	76, 30
Zhaoduan WPS	6	(Hai Jing) 31301–303, 46301–303	450	4,000+	76
Zhaojun WPS	9	21111, 33111, 35111, 37111, 44111, 45111, 46111–13	328	2,700	76
Shuoshi II WPS	4	(Hai Jing) 1501, 2501, 2502, 3501	426	5,800	76 (prov.)
Zhaolai WPS	4	(Hai Jing) 1401, 2401, 3401, 3402	325	4,800	76 (prov.)
Shucha II WPS	10	(Hai Jing) 1305–307, 2305–308, 3306–308	321	4,000	30
Hai Yang WPS (ex-PLAN)	1	(Hai Jing) 3368	345	3,325	none
Kanjie WPS (ex-PLAN)	1	(Hai Jing) 2506	425	5,830	removed
Type 053 Jiangwei I WFF (ex-PLAN)	3	(Hai Jing) 31239 [former PLAN FF 539], 31240 [former PLAN FF 540], 31241 [former PLAN FF 541]	367	2,000	37
Shusheng WPS	5	(Hai Jian) 1010, 2115, 3015, 7008, 9010	290	1,750	14.5 (prov.)
Shuke I/II/III WPS	20	I: (Hai Jing) 1127 II: (Hai Jing) 1123, 1126, 2166, 3175 III: (Hai Jing) 2112, 2113, 3111–13; (Hai Jian) 1002, 1013, 2032, 2168, 4001, 4002, 4072; (Yu Zheng) 46016	245–65	1,450	none
Shuyou WPS	3	(Hai Jing) 1117, 2146, 3171	242	1,000	none
Shuwu WPS	3	(Hai Jing) 1115, 2151, 3184	288	1,750	none
Tuzhong WPS (ex-PLAN)	3	(Hai Jing) 1310, 2337, 3367	278	3,300	none
Haixun II WPS	1	(Hai Jing) 31101	311	1,900	37, 23
Haijian WAGOR/WPS	4	(Hai Jian) 1118, 2149, 3172, 3174	230	1,350	none
Shuzao II/III WPG	15	II: (Hai Jian) 9012 III: (Hai Jian) 1015, 1116, 1117, 2030, 3011, 3012, 4067, 4073, 5030, 7018, 7028, 7038, 8003, 8027	215	600	12.7

CHINA COAST GUARD OFFSHORE SURVEILLANCE, PATROL, AND SOVEREIGNTY-ENFORCEMENT ORDER OF BATTLE (SELECTED) CONTINUED

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Guns (millimeters)
Type 618B-II WPG	30+	(Hai Jing) 015,* 12001, 13101, 13102, 21101–104, 31102, 32102, 33101, 33102, 35101–103, 37101, 37102, 44101, 44103, 45101, 45102, 46101, 46102, 46105, 46106 + more	201–208	650	25 or 30

Notes:
PLAN = People's Liberation Army Navy; prov. = provisional (i.e., collar fitted but no gun mounted); WAGOR = oceanographic research ship; WFF = coast guard frigate; WPS = coast guard patrol ship.
* This is a training vessel subordinate to the Maritime Police Academy, but is nonetheless fully combat capable.

Meanwhile, the PAP Maritime Police was primarily a coastal and riverine force not known for its members' seamanship skills, as most of its personnel originated in ground-based PAP units.[30] The CCG currently is building a significant number of patrol ships from two new, highly capable classes that apparently were ordered before CCG consolidation by the then PAP Maritime Police (i.e., the old coast guard). The larger of these classes, the Zhaoduan (Type 818), is the CCG's newest and fastest class under construction. It is based directly on the PLAN's Jiangkai II (Type 054)–class guided-missile frigate, using an almost identical hull and likely the same powerful 2+2 combined diesel and diesel (referred to as "CODAD") power plant. This naval design has proved highly reliable in PLAN antipiracy operations in the Gulf of Aden. The overall configuration of the Zhaoduan is similar to the Jiangkai II above the main deck as well, but with an additional superstructure deck added and some other topside changes. The Zhaoduan lacks the powerful combat systems of the Jiangkai II, eliminating the HQ-16 vertical-launch surface-to-air missile system, close-in-weapon systems, and long-range military electronics.[31] However, the Zhaoduan does retain the same 76 mm main gun as the Jiangkai II. Together with two 30 mm guns, this makes it the CCG's most heavily armed ship. Its helicopter landing area and hangar accommodate Z-9, AW109, or EC135 helicopters. With the propulsion system from the Jiangkai II but a reduced displacement of something over four thousand tons, the Zhaoduan likely can attain a top speed of over thirty knots, making it one of the world's fastest large coast guard ships, with a ten-thousand-nautical-mile range at fifteen knots. These qualities will make the Zhaoduan a go-to workhorse for the CCG. Six units of this class have been launched to date, and additional units have been ordered, according to some media sources.[32]

The CCG also is building the smaller Zhaojun (Type 718)–class cutter, using what appears to be an original design. Displacing 2,700 tons, the ship is 328 feet

long and forty-three feet in beam. Its estimated maximum speed is twenty-five knots, its range 6,500 nm. At least nine of these patrol ships have been launched to date, with several already operational, and additional units are possible. The Zhaojun has a helicopter deck and a small interceptor boat–launch facility. Like the Zhaoduan, it is fitted with a 76 mm main gun forward.[33]

Capable of operating offshore for regional security missions, Type 618B-II patrol combatants performed with distinction in the 2014 *HYSY 981* oil rig standoff. They displace 650 tons, are up to 208 feet long and thirty feet in beam, and have a large power plant capable of around thirty knots top speed and a two-thousand-nautical-mile range. They are also very maneuverable. The CCG's more than twenty-five hulls of this type each have a 25 mm or 30 mm main gun and high-capacity water cannon. Some units have a fast-boat launch ramp at the stern.

Today China boasts not only the world's largest navy but also the world's largest maritime law-enforcement fleet—by a sizable margin . . . —more hulls than the coast guards of all its regional neighbors combined.

Aside from these purpose-built border-defense ships and craft, the CCG has accepted three former PLAN Jiangwei I patrol frigates. Their missiles and most naval systems have been removed, but each retains twin 37 mm guns and a helicopter hangar. These ships are only two thousand tons in displacement, 367 feet in length, and 40.7 feet in beam; their strength is a top speed of around thirty knots and a range of 4,500 nm at eighteen knots.

FACILITIES

In recent years, copious open-source information has indicated that China is consolidating its myriad MLE facilities into a smaller number of larger bases with substantial berthing capacity and other shoreside infrastructure. Although the precise number of CCG maritime facilities in China is difficult to determine, the service is thought to have over two hundred total facilities at which ships or small craft are stationed.[34] However, fewer than forty of these are regarded as large bases that can accommodate offshore-capable patrol ships. The rest provide basing for coastal or local patrol craft and patrol boats. Many of these smaller bases are collocated with or near fishing harbors, and are home to FLE patrol craft that require limited shoreside infrastructure. Many other facilities host even smaller inshore patrol boats, and essentially are just a small pier or jetty with a single support building, if that.[35]

In recent years, the most substantial CCG bases have been expanded significantly, with much larger piers to accommodate all the new ships and substantial shoreside capacities, including barracks, athletic facilities, and, in some cases,

TABLE 5
SELECTED MAJOR CHINA COAST GUARD FACILITIES

Location	Province or Equivalent	Coordinates (approx. latitude/longitude)
Beihai	Guangxi	21.485, 109.084
Fangchenggang Shiping	Guangxi	21.626, 108.316
Qinzhou	Guangxi	21.736, 108.639
Jinzhou	Liaoning	40.846, 121.103
Fuzhou Guling	Fujian	26.055, 119.353
Fuzhou Tingjiang	Fujian	26.074, 119.513
Xiamen downtown	Fujian	24.467, 118.065
Xiamen China Coast Guard (CCG) base	Fujian	24.511, 118.065
Dalian Mianhuadao	Shandong	39.006, 121.675
Dalian Wantong	Shandong	39.010, 121.709
Yantai Yangma Dao	Shandong	37.444, 121.582
Yantai Zhifu Bay	Shandong	37.545, 121.392
Tianjin port area	Tianjin	38.985, 117.728 (vicinity)
Guangzhou Taihe	Guangdong	23.109, 113.395
Huangpu Changzhou	Guangdong	23.077, 113.432
Huangpu Luntou	Guangdong	23.078, 113.375
Shantou	Guangdong	23.353, 116.688
Zhanjiang Tiaoshun	Guangdong	21.286, 110.409
Qinhuangdao fishing wharf	Hebei	39.921, 119.617
Qinhuangdao coal terminal	Hebei	39.935, 119.668
Shanghai Fuxing Dao	Shanghai	31.288, 121.561
Shanghai Gaoqiao	Shanghai	31.357, 121.614
Shanghai port facility	Shanghai	31.384, 121.549
Nantong	Jiangsu	31.908, 120.910
Haikou port	Hainan	20.031, 110.278
Haikou Haidian River	Hainan	20.025, 110.323
Sanya	Hainan	18.233, 109.492
Wenchang	Hainan	19.560, 110.825
Qingdao Tuandao Inlet	Shandong	36.050, 120.298

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SELECTED MAJOR CHINA COAST GUARD FACILITIES CONTINUED

Location	Province or Equivalent	Coordinates (approx. latitude/longitude)
Qingdao port area	Shandong	36.082, 120.309
Qingdao Huangdao	Shandong	36.005, 120.272
Zhoushan Waichangzhi	Zhejiang	29.980, 122.082
Ningbo CCG Academy	Zhejiang	29.945, 121.710
Wenzhou Lucheng	Zhejiang	28.025, 120.672

Source: Located via Google Earth.

limited ship-repair facilities. Growing emphasis on ship repair shows both an understanding of a maturing fleet's operational needs and a desire to avoid being subordinated to the PLAN for access to maintenance. As part of these efforts, the CCG built its first floating dry dock. The dock can be moved to different locations, including South China Sea "features," and can accommodate smaller patrol ships.

Although the CCG reform began in 2013, in most cases the service's facilities remain somewhat segregated according to organizational mission; that is, bases that previously hosted FLE ships continue to host ships that perform fisheries-enforcement activities. It is unclear whether duplicative facilities will be eliminated in the future.[36]

CHINA MARITIME SAFETY ADMINISTRATION

MSA was not included in the 2013 CCG consolidation and remains an independent agency with its own fleet and facilities. MSA is responsible for the control and securing of China's maritime ports and commercial maritime traffic, for aids to navigation (buoys, lighthouses, etc.), for pollution control, and for SOLAS, among other missions. MSA's presence largely is limited to China's territorial waters, although the agency does have several large patrol ships that occasionally take long voyages for joint exercises with other nations' coast guard forces or to participate in search-and-rescue operations (such as searching for the missing plane from Malaysia Airlines Flight 370). However, the great majority of the MSA fleet is composed of hundreds of coastal patrol craft; thousands of inshore patrol boats; and a variety of specialized vessels used for buoy tending, hydrographic survey, pollution cleanup, and other utilitarian roles.[37]

MSA, while considered a law-enforcement agency, generally is not involved in territorial disputes (such as in the South China Sea or Senkakus), fisheries enforcement, customs, or other countercriminal activities. MSA maintains a good working relationship with regional forces, including the U.S. Coast Guard,

the Japan Coast Guard, and South Korea's Korea Coast Guard, and often works jointly with these forces.[38]

CHINA RESCUE AND SALVAGE

CRS, while not a law-enforcement organization, nonetheless is a government-run agency under China's Ministry of Transportation that has a substantial presence in China's maritime realm. CRS operates both in an official capacity (in support of SOLAS) and in a commercial capacity, taking on contract work ranging from towing stranded ships and salvaging sunken ships to transporting and placing commercial oil rigs.

Profits from this commercial side provide CRS with a substantial independent budget, much of which CRS spends on constant modernization of its impressively large fleet of rescue, salvage, heavy-transport, semisubmersible, and large crane ships. The most visible CRS units are the thirty-plus modern rescue and salvage ships, which spend most of their time loitering in busy maritime traffic areas and roadsteads off Chinese ports.

CRS has several major bases, some of which are collocated with or near CCG or MSA facilities, but CRS generally does not operate with or interact heavily with CCG forces.[39] While CRS's large ships may be present in the vicinity of maritime disputes, they typically are there only to provide rescue in case of damage to other-agency (or foreign) ships and do not get involved in any enforcement or deterrence activities.

CRS is highly regarded in the international maritime community owing to its courageous, professional, and experienced personnel, strong rescue ethic, modern and highly capable fleet of ships, and lack of involvement in maritime disputes. CRS ships often are contracted to perform transport and other work around the globe.[40]

In building both the world's largest coast guard and the largest overall MLE force, China has achieved an impressive increase in its maritime capabilities. It has leveraged massive capacity for building all sizes of patrol ships, cost relief from commercial construction profits, and domestic production of most systems (including engines and electronics) to field a formidable number and variety of ships specialized for different roles and operating areas. Enhanced CCG capacity is envisioned to allow the PLAN to focus on naval roles beyond the first island chain, with a commensurate reduction in PLAN small patrol craft over the past decade.[41] Moreover, new CCG ships capable of long-distance operations in higher seas—the largest capable of operating globally—could permit extended deployments beyond maritime East Asia (e.g., to conduct antipiracy patrols or

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perform escort duties along sea lines of communication). CCG modernization and expansion afford China presence and influence to further its East and South China Seas sovereignty claims while maintaining both domestic and international law-enforcement capability regionally.

China will continue to modernize its MLE agencies' respective fleets, with primary emphasis on the consolidated CCG. However, the winding down of the major ship-construction program of 2010–17 portends less class variation and more focus on future construction of a few (perhaps three or four) major classes and several minor classes, to streamline logistics and operations. Emphasis on size is giving way to emphasis on speed and filling capability gaps. The CCG likely will continue to grow numerically but is unlikely to repeat the rate of growth of the past decade—primarily because China by now has replaced virtually all its older, less-capable large patrol ships.

[M]assive infrastructure builds, evolutionary ship designs, and extensive use of commercial, off-the-shelf components offer China the ability to surge CCG ship construction rapidly.

In the coming decade, China likely will prioritize smaller coastal-patrol craft and patrol combatants to continue replacement of the large fleet of small craft that were built largely in the 1990s and are nearing the end of their operational life spans. The CCG undoubtedly will focus on remedying its major remaining areas of weakness: severe rotary-wing limitations (only about fifty helicopter-capable ships and few helicopters); uneven existing crew training, with seamanship competency depending on former agency; and ships being produced faster than new crewmembers can be trained.[42] To improve situational awareness, the CCG likely will acquire additional maritime-patrol aircraft, including helicopters (imported or domestic). It will strive to strengthen planning, communications, and operational control.

While China will continue to focus on security enforcement of its established territorial waters and EEZ, the CCG will continue to operate regularly throughout waters within the first island chain to support China's maritime claims, as well as to perform enforcement and surveillance operations. Forward-basing CCG units on augmented features in the Paracels and Spratlys will enhance operational tempo and facilitate coordination with the PLAN and PAFMM.

These expanding CCG capabilities support a decisive shift in Chinese maritime strategy: from a three-sea-force focus on regional seas to an evolving division of labor in which its first sea force—the PLAN—significantly increases its overseas missions and focus. While regional operations likely will remain the focus for China's second sea force, its MLE forces centered on the CCG, the larger CCG ships increasingly could deploy out of area into the Pacific and Indian

Oceans, both to increase presence and influence and to participate in joint coast guard exercises with other major countries, including the United States, Japan, South Korea, Russia, and India.

As before, designs will be adapted to suit new missions. Moreover, massive infrastructure builds, evolutionary ship designs, and extensive use of commercial, off-the-shelf components offer China the ability to surge CCG ship construction rapidly, if desired. When it comes to rapidity of fleet expansion and modernization, China's second sea force already is leading the way.

NOTES

Authors' note: The information in this article does not rely heavily on other finished academic papers or analyses, although several of these are cited for context. Instead, the great majority of supporting information derives from the authors' compilation and original analysis of a vast body of available open-source, firsthand information, almost all of which is posted on the Internet. The majority comes directly from tens of thousands of specific Internet and media sources that cannot be listed individually. For a full discussion of the documentation methodology and sources used herein, see the *China Analysis from Original Sources* website at the following url: www.andrewerickson.com/2019/02/open-source-research-on-chinas-maritime-law-enforcement-force-structure-development-methodology-references/.

1. This article surveys China's principal MLE ships from a platform-centric perspective, organized by mission set. Broadly categorized, MLE forces include the national-level China Coast Guard; the portion of China Marine Surveillance (CMS) and Fisheries Law Enforcement (FLE) vessels organized at the subnational level (which still exist and are active in the "gray zone," but are not included in the CCG); Maritime Safety Administration (MSA) vessels, which exist outside the CCG even at the national level; and China Rescue and Salvage (CRS) vessels, which are outside the CCG even at the national level and generally play only supporting (not MLE/sovereignty-upholding) roles. The present analysis spotlights the CCG as the core organizing entity for the majority of China's MLE forces at the national level, whose consolidation remains a work in progress, and refers to them broadly as "China's coast guard." The article also addresses some of the most important non-CCG ships, including from provincial-level—but not municipal—MLE organizations. This ecumenical, organizationally flexible approach, which acknowledges the complexities and vicissitudes of China's evolving empirical reality, has the virtue that the vessels themselves remain discrete and readily identifiable amid substantial changes in leadership, control, and nomenclature. China's MLE organizations have been reconfigured tremendously in recent years (and reforms remain ongoing), and vessels have shifted both among them (as well as having been transferred in from the PLAN) and in their relationship to the gray zone. The past decade also has witnessed multiple firsts in terms of China's MLE assets operating in certain areas. MLE fleet usage, like the general regional situation, is fluid. Ships from *all* the agencies (including FLE, General Administration of Customs [GAC], and MSA) have been observed participating in, or at least in the vicinity of, conflicts in the gray zone. For instance, while GAC vessels are absent from many gray-zone operations, GAC patrol craft can be seen in photos of the China National Offshore Oil Corporation *Haiyang Shiyou (HYSY) 981* oil rig operations. Accordingly, our coverage includes some MLE ships and forces (e.g., GAC, MSA, and CRS) that are not always involved in gray-zone operations, but conceivably could become involved in the future, particularly as features the Chinese have augmented in the South China Sea offer forward-deployment options. Moreover, not

all CCG ships are relevant to gray-zone operations. Some are too small to be considered "oceangoing," although this is a subjective term. For instance, many ships performing disputed-area operations and similar functions displace fewer than five hundred tons, leaving no identifiable size cutoff in this regard. Conversely, some ships outside the CCG are relevant to rights-protection/gray-zone missions. The CCG reorganization in 2013 incorporated only national-level assets, not provincial, county, or municipal MLE vessels. For example, the Zhongtao class is not actually part of the CCG, but rather is part of provincial-level fisheries-enforcement resources. CMS also has provincial-level cutters. Guangdong and Hainan Provinces have provincial-, county-, and municipal-level cutters relevant to rights-protection/gray-zone missions. One vessel dramatically encapsulates the value of a platform-centric approach: Having joined FLE in November 2010, Zhongyang-class patrol ship *Zhong Guo Yu Zheng 310* conducted multiple rights-protection missions when it was homeported in Guangzhou, including the 2012 Scarborough Reef standoff and its March 2013 jamming of Indonesian Ministry of Maritime Affairs and Fisheries vessel *Hiu Macan 001*. From July 2013 to May 2015 the vessel was designated CCG 3210 and participated in the 2014 *HYSY 981* incident. Redesignated *Sansha City Comprehensive Law Enforcement 1* in May 2015, the ship now is based in Sansha City and engages in further sovereignty missions. Scott Bentley, "Indonesia's 'Global Maritime Nexus': Looming Challenges at Sea for Jokowi's Administration," *The Strategist,* September 24, 2014, www.aspistrategist.org.au/; Ryan D. Martinson, "The Lives of a Chinese Gunboat," U.S. Naval Institute *Proceedings* 142/6/1,360 (June 2016), pp. 34–39. For the leading organization-centric analysis of the CCG, see Ryan D. Martinson, *Echelon Defense: The Role of Sea Power in Chinese Maritime Dispute Strategy,* China Maritime Study 15 (Newport, RI: Naval War College Press, February 2018), available at digital-commons.usnwc.edu/. The authors thank Ryan Martinson and Barney Moreland for helpful inputs.

2. For analysis of Chinese MLE participation in gray-zone operations, see Andrew S. Erickson and Ryan D. Martinson, *China's Maritime Gray Zone Operations* (Annapolis, MD: Naval Institute Press, 2019).

3. Ryan D. Martinson, "China's Second Navy," U.S. Naval Institute *Proceedings* 141/4/1,346 (April 2015), available at www.usni.org/.

4. Lyle J. Morris, "Blunt Defenders of Sovereignty: The Rise of Coast Guards in East and Southeast Asia," *Naval War College Review* 70, no. 2 (Spring 2017), p. 84. Japan's coast guard has around eighty hulls and South Korea's forty-five, and the U.S. Coast Guard has fifty. Unless otherwise specified, all such numbers represent the authors' estimates based on open sources.

5. Tonnage and displacement are not an accurate measure of sea keeping. For example, many PAFMM boats can operate across the ocean, but most are below five hundred tons. In contrast, some vessels of greater than a thousand tons are not suited to offshore operations. For ease of readability and metrics, this article's tables group vessels as "oceangoing" or "offshore capable," but in reality there is no set measure for assigning a ship to such categories. The phrase *capable of operating offshore* and the numbers associated with it are the product of analysis aimed at determining which specific ships can operate competently at significant distances from the coast. Ships that cannot operate offshore are not included, regardless of displacement.

6. The CCG lacks underway replenishment capabilities, so port access is essential when additional supplies are needed.

7. Ryan D. Martinson, "From Words to Actions: The Creation of the China Coast Guard" (paper presented at the "China as a 'Maritime Power' Conference," CNA conference facility, Arlington, VA, July 28–29, 2015), p. 14, available at www.cna.org/.

8. Office of Naval Intelligence, *The PLA Navy: New Capabilities and Missions for the 21st Century* (Washington, DC: 2015), pp. 44–45, including fig. 5-3 ("Regional Maritime Law Enforcement Comparison"); Martinson, "From Words to Actions"; Swee Lean Collin Koh, "Beijing's 'White Hull' Challenge in the South China Sea," *National Interest,* January 13, 2016, www.nationalinterest.org/.

9. Stephen Saunders, China listings in *IHS Jane's Fighting Ships,* 116th ed. and earlier.
10. Most U.S.-allied military organizations used this term during the 1990s and early years of the following decade to describe white hulls. WAGOR = (W)AGOR, with *W* indicating a nonnaval designation and *AGOR* signifying an oceanographic research ship.
11. Masafumi Iida, "Maritime Expansion by China," *Sasakawa USA,* October 22, 2014, spfusa.org/.
12. By contrast, SOA drew its officers primarily from among retired PLAN officers and MSA drew its officers from the merchant fleet, so both services had an easier time adapting to larger offshore vessels. Barney Moreland [Capt., USCG (Ret.)], personal interview, December 3, 2018. Captain Moreland is a former U.S. Coast Guard liaison officer to China.
13. Its launch was delayed by several years because the 2008 Wenzhou earthquake caused the government to sweep unspent moneys to effect recovery, which pushed back shipbuilding schedules. To cover the gap, FLE took possession of an old PLAN submarine rescue ship and recommissioned it as *FLE 311,* until the purpose-built cutter 310 could be constructed. Ibid.
14. The Fisheries Law Enforcement Command also has had a very close working relationship with the U.S. Coast Guard.
15. Xiao Ming, "China Maritime Safety Administration in the New Millennium: Challenges and Strategies," Paper 424 (dissertation, World Maritime Univ., 2000), especially pp. 13, 21, available at commons.wmu.se/.
16. See, for example, Yang Chang, "Zhongguo Haijian Tianjin Shi weiquan zhifa chuandui guapai" [CMS Tianjin rights-protection law-enforcement fleet is set up], *China Ocean News,* April 19, 2013, p. 4; Martinson, "From Words to Actions," pp. 18, 44–45; Ryan Martinson, "Power to the Provinces: The Devolution of China's Maritime Rights Protection," Jamestown Foundation *China Brief* 14, no. 17 (September 10, 2014), available at jamestown.org/.
17. 孙鼎 [Sun Ding], 海监队员是怎样炼成的 ["How CMS Personnel Are Trained"], 中国海洋报 [*China Ocean News*], December 27, 2013, p. 3; Martinson, "From Words to Actions," pp. 14, 22; 海洋发展战略研究所课题组 [China Institute for Marine Affairs Special Topic Group], 中国海洋发展报告 (2013) [China's Ocean Development Report (2013)] (Beijing: Ocean, 2013), p. 267.
18. Very few of the "new," more specialized ships were constructed after the CCG consolidation of 2013. The consolidation happened only five years ago, so most ships launched by the time of publication were ordered, or at least planned, before that happened. To date, the postconsolidation CCG has not received many new ships of its own.
19. Despite Internet speculation, however, the Zhaogao is not based on the Jiangdao-class corvette.
20. "China Coast Guard Gets New Patrol Vessel Based on PLAN's Type 056 Corvette," *Navy Recognition,* February 4, 2016, www.navyrecognition.com/.
21. This refers to the same kind of joint patrols and open-ocean fisheries surveillance that FLE has been doing for years with smaller, less-capable patrol ships.
22. Lyle Goldstein, "Chinese Fisheries Enforcement: Environmental and Strategic Implications," *Marine Policy* 40 (2013), pp. 187–93, available at digitalcommons.unl.edu/; "Fisheries Law Enforcement Command," GlobalSecurity.org.
23. A ship's *tumblehome* refers to the narrowing of its upper hull as it rises above the waterline, primarily to reduce radar and wake signatures.
24. "CMS—China Marine Surveillance," GlobalSecurity.org; "China Coast Guard," *OPLAN: China* (blog), n.d., www.oplanchina.blogspot.com/.
25. The press releases that announced the Zhaotou flagships' launch specifically highlighted that this class had hulls that were reinforced for ramming and shouldering, but were surprisingly mute regarding traditional coast guard capabilities (e.g., how many boarding teams they could deploy, or their rescue capabilities). They have substantial command and control suites aboard, including conference rooms and command centers, and can berth VIPs. Apart from being a floating command center, they have no capabilities that smaller, faster, cheaper cutters do not share. Moreland interview, December 3, 2018.

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26. China Shipbuilding Industry Corporation, hundreds of press releases 2005–17, available at www.csic.com.cn/.
27. Notably, as the Shucha II class became operational, in recent years the two Shucha Is were transferred back to SOA's scientific branch and renamed with Xiang Yang Hong prefixes, not the Zhong Guo Hai Jian and Hai Jing prefixes on the newer ships.
28. Firsthand design analysis based on photography of the MSA Shuoshi I– and CCG Shuoshi II–class ships.
29. Firsthand analysis of design, compared with CRS heavy salvage ships.
30. "People's Armed Police," GlobalSecurity.org.
31. Photography from *Super Base Camp Military Forum,* www.cjdby.com, and other web forums, compared with the known configuration and design of the Jiangkai II frigate.
32. SinoDefence forum and blog articles, www.sinodefenceforum.com/.
33. Hobbyshanghai web forums and blogs, www.hobbyshanghai.net.cn/.
34. This is based on extensive examination of press articles, photography, and commercially available satellite imagery (Google Earth, etc.).
35. China Defense.com forum and blog, www.china-defense.com/. This discussion forum has an extensive subforum devoted to discussion of maritime and naval basing in China, which was used to supplement firsthand searches via open-source imagery.
36. Google Earth, www.google.com/earth. This open-source imagery program is available online. Results are from personal searching of China's coastline over several years, revealing confirmed and probable base locations for CCG ships. Google Maps (www.google.com/maps) then was used to determine the locality names of these bases and facilities. See also China Defense.com forum and blog.
37. China MSA official website, various dates 2005–18, en.msa.gov.cn/. The material includes thousands of official press releases detailing MSA ship launches, ship orders, ship ceremonial events, operational mission details, and photography.
38. According to MSA's extensive and comprehensive daily press releases. Ibid.
39. It does coordinate frequently with MSA.
40. China Rescue and Salvage official website, various dates 2005–18, en.crs.gov.cn/. CRS regularly posts press releases and photography of CRS contracts, ship launches, operations, and rescue/salvage work. Multiple CRS bureaus also maintain their own websites. Details of CRS missions, basing locations, and order of battle from Song Jiahui [Capt.], Director-General, CRS, "Maritime Rescue and Salvage in China: A General Introduction and Some Typical Cases" (PowerPoint presentation, November 2009), available at www.transportation.gov/.
41. While China's three sea forces already have made some progress in implementing this division of focus, the pushback on China's maritime expansionism from immediate neighbors as well as the United States and other Western countries is keeping much of the PLAN currently pinned down in the South and East China Seas upholding China's expansive claims.
42. Ryan D. Martinson, "The Arming of China's Maritime Frontier," China Maritime Report 2, *U.S. Naval War College,* June 2017, www.usnwc.edu/.

Dr. Andrew S. Erickson is a professor of strategy in the China Maritime Studies Institute and the recipient of the inaugural Civilian Faculty Research Excellence Award at the Naval War College. He serves on the editorial board of the Naval War College Review *and is an associate in research at Harvard University's John King Fairbank Center for Chinese Studies. In 2013, while deployed in the Pacific as a Regional Security Education Program scholar aboard USS* Nimitz, *he delivered twenty-five hours of presentations. Erickson is the author of* Chinese Anti-ship Ballistic Missile Development *(Jamestown Foundation / Brookings Institution, 2013).*

Joshua Hickey is a senior analyst for the Department of the Navy, with over fifteen years of direct subject-matter experience.

Henry Holst is a consultant for Deloitte.

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