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China Maritime Law Enforcement Surface Platforms

Order of Battle, Capabilities, and Trends

CHINA'S ARMED FORCES are divided into three major organizations, each of which has a maritime subcomponent. The People's Liberation Army (PLA) Navy (PLAN) claims a growing portion of the PLA's personnel and resources; the People's Armed Police (PAP) leads China's maritime law enforcement (MLE) forces, including the China Coast Guard (CCG); and the militia contains a growing proportion of sea-based units, the People's Armed Forces Maritime Militia (PAFMM). Each of China's three sea services is the world's largest in terms of ship numbers.¹ Unlike the military-focused shipbuilding industry in the United States, 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 comprising MLE forces, centered on the consolidating CCG.

For over a decade, China has been undertaking a massive MLE modernization program that has greatly increased its capability to operate MLE vessels in remote areas. A key component of near seas gray zone maritime operations, China's coast guard affords Beijing increasing influence over the regional maritime situation without the direct use of gray-hulled combatants,

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demonstrating power while reducing the risk of escalation and allowing the PLAN to focus on other naval missions farther afield.

This buildout has yielded Beijing a formidable “second navy.”² Today China boasts not only the world’s largest navy, but also the world’s largest MLE fleet, by a sizeable margin. Within this MLE fleet, this chapter counts as the CCG the recently established Chinese organization of that name together with its subordinate organizations: the State Oceanic Administration (SOA), Bureau of Fisheries (BOF)/Fisheries Law Enforcement, Maritime Customs Service (formerly General Administration of Customs [GAC]), and Public Security Bureau/People’s Armed Police Maritime. Two other major Chinese maritime agencies—the Maritime Safety Administration (MSA) and China Rescue and Salvage (CRS)—are not associated with the CCG (and thus are not included in the overall number count in the text or in exhibit 7-1). As of 2017, a contingent of more than 17,000 CCG personnel³ crewed 225 ships of more than 500 tons capable of operating offshore in addition to more than 1,050 vessels confined to closer waters, for a total of at least 1,275 hulls—more than the coast guards of all its regional neighbors combined.⁴ At more than ten thousand tons full load, its two Zhaotou-class patrol ships are the world’s largest coast guard ships.

In terms of qualitative improvement, China has now replaced almost all its older, less capable large patrol ships. It is applying gold standard lessons learned from scrutinizing the U.S. and Japanese coast guards, as well as from the CCG’s increasing experience operating farther offshore for longer periods. The resulting new ship features include helicopters, interceptor boats, deck guns, high-capacity water cannon, and improved seakeeping.

Most newly built CCG ships have helicopter decks, some with hangars (although the CCG has very few helicopters). Many new CCG ships have quick-launch boat ramps on the fantail, allowing for rapid deployment of approximately ten-meter-long fast interceptor boats, thereby improving their capability for visit, board, search, and seizure law enforcement against fishing boats or other ships. A number of new ships have 30-millimeter (mm) guns mounted, with a few of the larger ships carrying 76-mm main guns. Most recently constructed CCG ships now have high-output water cannon mounted high on their superstructure. The 2014 Hai Yang Shi You (HYSY) 981 oil rig standoff demonstrated their utility as they damaged bridge-mounted equipment on Vietnamese vessels and forced water down their exhaust funnels.⁵ Internet photographs indicate that many CCG ships built within the last five years have a data link antenna (such as the HN-900) similar to those on PLAN vessels and to the U.S. Navy’s Link 11; older CCG ships are now being retrofitted with them.

Jerry Holst

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China's civil maritime buildup is slowing but is far from over: by 2020, the CCG is expected to have 260 ships capable of operating offshore.⁶ Many are capable of operating anywhere in the world.⁷ Numbers of small craft are not expected to change significantly; we estimate that the CCG will still own another 1,050 smaller vessels confined to closer waters, for a total of more than 1,300 hulls. From 2005 to 2020, this will represent a 15-year net increase of 400 total coast guard ships and craft, including more than 200 additional ships capable of operating offshore—representing 350 percent growth in the latter category. As exhibit 7-1 indicates, all types of CCG ships have increased in numbers, with the proportionately most significant force level increases for oceangoing patrol ships (more than 2,500 tons).

Building on the preceding discussion of the rationale, doctrine, and leadership impetus that motivate China's MLE operations, this chapter assesses the vessels that it employs to execute them, their overall order of battle, their capabilities, and trends and implications. We survey a wide swath of Chinese MLE ships from a hardware-centric perspective, organized by mission set. We chose

Exhibit 7-1. China Coast Guard Force Level, 2005–20

Force Level (type, displacement in tons)	2005	2010	2017	2020	Fifteen-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
<i>Subtotal: Ships that can operate offshore</i>	<i>58</i>	<i>100</i>	<i>225</i>	<i>260</i>	<i>202 (350%)</i>
Coastal patrol craft (100–499)	350	400	450	450	100
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.)

* 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.

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this approach because the vessels themselves remain discrete and readily identified even amid substantial changes in leadership, control, and organization. This remains true even as 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 been transferred in from the PLAN) and in their relationship to the gray zone. The past decade 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 of the agencies (including the BOF, Customs, and other agencies) have been observed participating in and/or 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 HYSY 981 oil rig operations. While China's civilian safety of life at sea (SOLAS) organizations such as the MSA and CRS are not typically present in gray zone operations, they occasionally operate nearby in order to mitigate any resultant safety or pollution control concerns that could develop.

However, these agencies are not thought to be involved in actual operations against foreign forces. 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 operating in disputed areas and operations are less than five hundred tons, leaving no substantive size cut-off in this regard. Conversely, there are ships outside the CCG that are relevant to rights protection/gray zone missions. The CCG reorganization in 2013 only incorporated national-level assets. It did not include provincial, county, or municipal MLE vessels. For example, the ubiquitous *Zhongtao*-class small patrol ships are not actually part of the CCG but rather are part of provincial-level fisheries enforcement. China Marine Surveillance (CMS) also has provincial-level patrol ships, which vary in their rights protection involvement, depending on subordination.

Foundation

China's MLE modernization program has proceeded in three major phases, the latter two of which overlap. Phase one (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 two (2010–17) yielded dozens of new purpose-built offshore patrol ships. These ships, which are much larger than phase one vessels (three thousand to ten thousand tons full load), have substantially more

capability than the older ships detailed previously. Phase three has generally consisted of smaller and medium-sized patrol craft and patrol combatants for coastal and near-coastal use, with only a limited number of larger ships built.

In 2013, China consolidated four of its five major maritime law enforcement agencies (the "five dragons"), with only the MSA remaining independent. 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 vessels is both cheap and efficient. The use of commercial off-the-shelf drivetrains and electronics and the absence of complex combat systems facilitate rapid assembly, with multiple units being built simultaneously. According to contract and media details, typical total construction time (from start to commissioning) is twelve to eighteen months for a large patrol ship (WPS; more than one thousand tons), and nine to twelve months for a smaller patrol craft or patrol combatant (under one thousand tons).

China had made a national-level decision by 1999 to start expanding and modernizing its MLE agencies.⁸ The majority of the shipbuilding budget was allocated to the organization then known as the CMS, primarily responsible for enforcing Chinese maritime territorial claims and conducting offshore law enforcement.⁹ Prior to the turn of the century, the CMS force consisted mainly 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 were configured specifically for law enforcement duties, as no guns, helicopters, fast interceptor boats, water cannon, or other MLE equipment were fitted.¹⁰

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 between the three CMS branches (north, east, and south). Typical of earlier dual-use patrol ships (colloquially known as WAGORs¹¹), all three classes were fitted with stern A-frames and cranes to enable them to handle hydrographic and oceanographic research equipment, although few have ever been seen performing such roles. Significantly, the *Shucha I* class was the first to be fitted with a helicopter landing deck and hangar facilities, indicating that the CMS intended to

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perform offshore missions requiring helicopter support. However, in keeping with the SOA/CMS's stated primary scientific mission, none of these new ships were armed with any permanent weapons.²² 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 600 to 1,500 tons.

China's other maritime law enforcement agencies, which historically only had limited offshore roles and capabilities, began to acquire some ships capable of operating offshore. By 2007 the PAP Maritime Police acquired its first large patrol ship, the *Haixun II*-class *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, and immigration enforcement (as well as regime security). *Haixun II* was equipped with a 37-mm main gun and a helicopter deck. It was more than four times the displacement of most PAP maritime patrol craft, and its restricted initial operations showed the PAP Maritime Police's discomfort with operating larger ships: most PAP maritime patrol craft crew were drawn from land-based defense forces rather than maritime backgrounds. For most of its early career, *Haixun II* rarely ventured beyond coastal waters. It was largely seen 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, which already operated several dozen aging offshore patrol ships used for resource protection and fisheries enforcement, began its own modest modernization program in the early 2000s. This consisted mostly of introducing new coastal patrol craft classes but culminated in the construction of the then-impressive *Zhongyang*-class large patrol ship *Zhong Guo Yu Zheng* 310 (later transferred to the Sansha City Municipal Authority), which was launched in 2010. As with other MLE agencies' recent acquisitions, the BOF chose to equip WPS 310 with a helicopter deck and hangar, although the bureau did not actually own any helicopters. In its initial years, the BOF used WPS 310 extensively for offshore patrol duties, and in later years it would be a proof of concept for at least one follow-on class that now forms the backbone of the BOF.

The fourth major maritime law enforcement agency, the GAC, had in the early 2000s just finished building more than thirty new two hundred-ton patrol craft (*Hailin I/II* classes) for coastal countersmuggling operations and did not have a significant ship construction program ongoing after about 2003.

The China MSA continued its own construction program, acquiring a variety of ships to fulfill its specialized missions—buoy tending, environmental

cleanup, search and rescue, light maritime towing and salvage, and port operations. The administration also acquired several large patrol ships able to respond to offshore maritime disasters and emergencies and interact with major coast guard organizations from other Pacific countries. Of the five dragons, the MSA was the first to obtain purpose-built large patrol ships capable of transoceanic operations, with the two *Shubian*-class ships attending joint exercises in Hawaii and other distant locales and later participating in long-term missions including the search for the missing Malaysian Airlines flight 370 in the Indian Ocean. Unlike China's other MLE agencies, the MSA has consistently maintained a close working relationship with the U.S. Coast Guard, Japan coast guard, and other regional MLE organizations, and strives to avoid involving itself in territorial conflicts.¹³ Unlike the other dragons, the MSA has historically acquired a large portion of its funding from collection of port fees for commercial shipping, allowing it some amount of budget autonomy from People's Republic of China (PRC) leadership and national budget issues.¹⁴

Moving Forward: China's New Coast Guard

As noted, 2013 saw the integration (at least on paper) of four of these agencies into the new China Coast Guard. This reform was 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.¹⁵ There was little cooperation, with each organization apparently focusing on its own ship designs (particularly the BOF and the CMS).

Shortly before CCG integration, the CMS force also acquired several auxiliary ships that had recently been retired from PLAN service. These transfers were likely intended to fill gaps in patrol capabilities as China began to more assertively pursue maritime expansion in the South and East China seas. They included three former intelligence collection ships (the icebreaking *Yanbing*-class former auxiliary general intelligence [AGI]-723, the *Xiang Yang Hong* 9-class former AGI-852, and the *Haiyang*-class former AGI-411), as well as several other old PLAN auxiliaries, including a converted cable layer, a mine-layer, and three large ocean salvage tugs. The former PLAN ships were immediately pressed into service (largely without naval guns and electronics), while the CMS—soon to be the CCG—ship construction program proceeded.¹⁶

One hallmark of CCG modernization in recent years has been the clear specialization of ships and craft for particular missions, an outcome of

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procurement programs initiated in the era of the five dragons.¹⁷ 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 one thousand-ton patrol ship design since the program started almost a decade ago. The original variant (*Shuyou* class) was essentially a dual-purpose research and patrol ship for the 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/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 better handle open water operations.

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. and Japan coast guards) and lessons learned from CMS, BOF, and other CCG agency ships operating farther offshore for longer extended periods.

Maritime Customs and Antismuggling

The segment of the CCG that performs maritime customs enforcement has been active in acquisitions in recent years, replacing most of its fleet of small patrol craft built in the 1980s and 1990s with three new classes of ships intended specifically for maritime law enforcement and customs duties (see exhibit 7-2 for order of battle). 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 39 feet at 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.¹⁸ These ships are also equipped with two quick-launch davits for

fast interceptor boats that can be deployed while under way. They 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 4 diesels providing a full-power speed of more than 30 knots via 4 shafts and propellers and a range of 5,000 nm at 15 knots. The 625-ton *Hutao I* measures 223 feet long and 28.5 feet at 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 as well as two smaller guns and water cannon. At least eight *Hutao Is* are already operational, and additional units continue to be built. In 2018 China launched two of an improved *Hutao III* class for CCG as well. (*Hutao II* was an export design.)

A third class, the *Hulai II*, is cosmetically similar to the ubiquitous Dutch *Damen Stan* Patrol 4607, a patrol craft operated by more than a dozen navies and coast guards internationally. However, the *Hulai II* adds a third engine, once again giving it a top speed of more than 30 knots for missions inside China's EEZ, particularly maritime customs interdiction, and a range of 1,200 nm at 18 knots. The 330-ton *Hulai II* is 177 feet long and 24 feet at beam and is also 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. Variations of both the *Hutao I* (*Hutao II*) and the *Hulai II* designs have been sold to export customers (the latter for Pakistan) in recent years, indicating that these are competitive, effective designs in a crowded international patrol craft market. More than two 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 1990s.

Long-Range Fisheries Enforcement

Fisheries enforcement and resource protection in furtherance of China's territorial claims have always been a primary mission of China's maritime agencies, specifically the BOF. The bureau's integration into the CCG likely improved the budgetary situation for this agency, which historically had relied on a jumble of older, less capable patrol ships, a hodgepodge of patrol craft, and assorted converted fishing boats to execute its mission. Over the past decade, however, the CCG's fisheries enforcement branch embarked on an active program to replace and modernize its entire fleet (see exhibit 7-3 for order of battle).

Exhibit 7-2. Maritime Customs Order of Battle (Selected)*

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Guns (millimeter)
<i>Zhaogao</i> large patrol ship (WPS)	3	(<i>Hai Jing</i>) 33103 (Zhejiang), 44104 (Guangdong), 46014 (Hainan)	308	1,750	30mm

Exhibit 7-2. Maritime Customs Order of Battle (Selected) *

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Guns (millimeter)
<i>Zhaogao</i> large patrol ship (WPS)	3	(<i>Hai Jing</i>) 33103 (<i>Zhejiang</i>), 44104 (<i>Guangdong</i>), 46014 (<i>Hainan</i>)	308	1,750	30mm
<i>Hutao</i> I patrol combatant (WPG)	8+	(<i>Hai Jing</i>) 31101, 31103, 33104, 35104, 44105, 44106, 45103 + more	223	625	30mm
<i>Hutao</i> III WPG	2	44109, 44110	223	625	30mm
<i>Haihei</i> fast response cutter (WPC)	2	(<i>Hai Guan</i>) 905 + another	205	450	37mm
<i>Haifeng</i> WPC	5	(<i>Hai Guan</i>) 900-904	190	440	14.5mm
<i>Hulai</i> II WPC	25+	(<i>Hai Jing</i>) 33004, 35007, 37001, 44005, 44008, 44015-18, 44020, 44021, 45001, 45002, 46003 + more	177	330	14.5mm
<i>Hailin</i> I WPC	25+	(<i>Hai Jing</i>) 44059, 44068, 44069; (<i>Hai Guan</i>) 853-880 (probably have new pennants now)	170	230	23mm, 14.5mm
<i>Hailin</i> II WPC	10+	(<i>Hai Jing</i>) 35089, 33086, 31088, 21091; (<i>Hai</i> <i>Guan</i>) 881-90 (probably have new pen- nants now)	170	230	23mm
Type 611 WPC	~10	(<i>Hai Jing</i>) 33028; (<i>Hai Guan</i>) 823-30 (prob- ably have new pennants now)	145	170	14.5mm
<i>Haigao</i> WPC	10+	(<i>Hai Guan</i>) 810-20 (probably have new pennants now)	140	100	14.5mm

* China's maritime law enforcement agencies possess several hundred classes of ships; to keep this and subsequent tables manageable, only the most significant classes are included.

Most notable with regard to long-distance fisheries enforcement is the new *Zhaoyu*-class large patrol ship, a dozen of which were commissioned from 2014 to 2016. The 3,500-ton *Zhaoyus*, 360 feet long and 46 feet at beam, have a traditional combatant-style hull optimized for long-distance cruising in heavy seas, as these ships are intended for operations well outside of China's disputed maritime periphery—in theory, anywhere.¹⁹ This class has an estimated top speed of 25 knots, with a range of 7,500 nm at 14 knots. Design modifications were made based on lessons learned from the BOF's former flagship, the one-off *Zhongyang*-class patrol ship *Zhong Guo Yu Zheng* 310, which was recently transferred to the Sansha City municipality. The bureau likely identified some design and stability flaws in the ship and improved the subsequent *Zhaoyu* configuration, lowering 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.²⁰

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.²¹ The 3,500-ton ship is 360 feet long and 49 feet at beam and has a 30-mm gun. A proof of concept for the CCG's first electric-drive propulsion, complete with diesel generators, the sole *Zhaochang* built to date yields only 20 knots at top speed but has a long range of 10,000 nm at 15 knots.

For regional fisheries enforcement operations—particularly in disputed fisheries areas adjacent to Vietnam (e.g., the Tonkin Gulf), Japan, and the Koreas—the CCG built fifteen smaller patrol ships, the *Zhaotim* class. The 269-foot-long, 39-foot beam, 1,764-ton ships in this class are optimized for regional, medium-endurance patrols with a reported 7,500-nm range at 13 knots, ice-strengthened hull (for operations in the northern Bohai Gulf), a 30-mm gun, 2 small fast interceptor boats, and a moderate towing capability to assist disabled fishing boats. With its regional, near-shore focus, the *Zhaotim* lacks helicopter facilities. The relatively beamy, low-slung hull design, with bulbous bow, indicates that seakeeping 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, which are typically low-speed, cannot outrun even a patrol ship with a top speed of twenty knots such as the *Zhaotim*.)

Provincial-level fisheries law enforcement agencies have also undertaken a major modernization program. As late as the 1990s, PRC coastal fisheries enforcement was performed predominantly by converted fishing boats and

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various older patrol craft. However, in the last decade local forces have built about a dozen different designs of 35- to 60-meter coastal patrol craft and combatants for more local, short-endurance enforcement duties. Most notably, the 50-meter, 450-ton *Zhongtao* class has been in constant production since the early 2000s, with more than 50 units built at a number of different shipyards. All units share a common hull and basic superstructure design, but—depending on operational location and typical weather conditions—vary significantly in topside fit. For operational areas where militant fishermen may use collisions and shouldering as a defense against enforcement (e.g., the Tonkin Gulf), *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 Bohai Gulf may have ice-strengthened bows. Earlier units used davit-launched small interceptor boats, while later units have a stern gate and quick-launch ramp. The *Zhongtao* is yet another example of the coast guard adapting and learning operational lessons when designing and building new ships and patrol craft.

Offshore Surveillance, Patrol, and Sovereignty Enforcement

While the CCG in its entirety has a general role of offshore surveillance and patrol (particularly with larger patrol ships) as well as border defense and territorial enforcement, historically these roles were played primarily by the two dragons not examined previously: the CMS and the PAP Maritime Police (also known as the “old coast guard”). The CMS was primarily 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, the CMS substantially bolstered its new shipbuilding programs during and after consolidation with orders for several large new ship classes (most of which were eventually commissioned into the now-consolidated CCG). New CMS ships were clearly 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 SOLAS roles than CCG ships built prior to 2012 (see exhibit 7-4 for order of battle).²²

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 due to their enormity: with a length of 165 meters (541 feet), a beam of at least 20

Exhibit 7-3. Fisheries Enforcement Order of Battle (Selected)

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Gun(s) (millimeter/caliber)
<i>Zhaochang</i> large patrol ship (WPS)	1	(<i>Hai Jing</i>) 2301	360	3,500	30-caliber
<i>Zhaoyu</i> WPS	12	(<i>Hai Jing</i>) 1301-4, 2302-4, 3301-5, 46305	360	3,500	30-caliber
<i>Zhaotim</i> WPS	15	(<i>Hai Jing</i>) 1102-4, 3104-6, 21115, 31115, 33115, 35115, 37115, 46115 (<i>Yu Zheng</i>) 45005, 45013, 45036	269	1,764	30-caliber
<i>Dalang I</i> WPS (ex-People's Liberation Army Navy)	1	(<i>Hai Jing</i>) 3411	370	4,500	30mm
<i>Zhongeng</i> WPS	10+	(<i>Yu Zheng</i>) 13001, 32501, 33001, 33006, 35001, 37008, 44061, 45001, 46012 + more	180	~1,000	14.5mm
<i>Zhongwen</i> WPS	1	(<i>Yu Zheng</i>) 21103	195	850	Unknown
<i>Zhongke</i> WPG	6+	(<i>Yu Zheng</i>) 21101, 21111, 33018, 33205, 27061, 45002 + possibly more	180	~500	Unknown
<i>Zhongem</i> WPG	1	(<i>Yu Zheng</i>) 3736	190	550	14.5mm

<i>Zhongtao</i> fast response cutter (WPC)	50+	(<i>Yu Zheng</i>) 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 +	160-170	300-400	14.5mm
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<i>Zhongke</i> WPG	6+	(<i>Yu Zheng</i>) 21101, 21111, 33018, 33205, 27061, 45002 + possibly more	180	~500	Unknown
<i>Zhongem</i> WPG	1	(<i>Yu Zheng</i>) 3736	190	550	14.5mm

<i>Zhongtao</i> fast response cutter (WPC)	50+	(<i>Yu Zheng</i>) 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	160-170	300-400	14.5mm
<i>Zhongsui</i> WPC*	6	(<i>Yu Zheng</i>) 35199, 44601-3, 44606, 45003	165	~350	14.5mm
<i>Duancude</i> WPC*	10+	(<i>Yu Zheng</i>) 21402, 31006, 37057, 37206, 37518 + more	130	~200	None
<i>Nanhua</i> Type A WPC*	~10	(<i>Yu Zheng</i>) 44025, 44081, 44121, 44168; (<i>Hai Jian</i>) 9040, 9060 (additional units operated by China Maritime Safety Administration and People's Liberation Army Maritime Transport Squadron/ MTS)	110	150	23mm
<i>Zhonghong</i> WPC*	10+	(<i>Yu Zheng</i>) 13203, 13301, 32511, 37078, 37163, 37606, 37607	100-120	~150	None
Fisheries Patrol trawlers*	30+	(<i>Yu Zheng</i>) variety of designs and numbers	100-120	Varies (250- 600 tons)	None, generally
Red Arrow large patrol boat*	100+	Four digits ending in H	40	15	None

* These classes, while relatively small in tonnage, are deployable to Chinese-occupied features in the South China Sea and may well be thus utilized.

meters (65-plus feet), and at 10,000 or more tons full load, they displace more than modern naval destroyers. Their estimated speed is 25 knots, their range 15,000 nm. However, the 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.

There are rumors that the ships were ordered directly in response to Japan's 2013 deployment to the Senkakus of its 9,500-ton *Shikishima*-class cutters, which at the time dwarfed any ships in the CCG inventory—suggesting that construction of the *Zhaotou* class was 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 does nonetheless 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, due to its berthing requirements and presumably higher cost of operations without any tangible benefit in capability compared to smaller CCG patrol ships.²³

Since consolidation, the CCG's three most effective new classes of large patrol ships have been the *Shucha II*, *Shuoshi II*, and the *Zhaolai*, all of which are based on earlier classes 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 the CMS in the early 2000s. 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 drivetrain using steerable electric propulsor pods—giving it excellent maneuverability as well as good cruising efficiency and range. Moreover, the *Shucha II* has positions available for installation of 30-mm main guns in the future, if required.²⁴

Arguably the most capable and versatile class in the CCG, the four *Shuoshi II*-class units are based on the MSA's flagship *Hai Xun 01*, built several years earlier. The vessels, 130 meters (426 feet) long and 16 meters (52 feet) at beam, with a 5,800-ton displacement, are similar in overall size and general configuration to the U.S. Coast Guard's *Legend*-class national security cutter. The *Shuoshi II* is configured for long-distance open-ocean operations in any weather condition. It is fitted with high-capacity water cannon and a

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helicopter landing deck and hangar, and has design provisions for the future fit of a 76-mm gun. Unlike many other large purpose-built patrol ships operated by the CCG, however, *Shuoshi II*'s aft area is considered a "working stern," capable of performing light rescue and salvage operations as well as 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 if additional hulls will be built, it is one of the world's most capable, versatile MLE vessels.²⁵

The *Zhaolai*-class patrol ship was likely an off-the-shelf design intended to quickly provide capability vis-à-vis Japanese and Vietnamese interactions in the Senkakus and 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, 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. The CCG's four *Zhaolais* are also equipped with a helicopter landing deck and have 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 best configured for heavy towing and shouldering of other ships, and its high-mounted large water cannon can be used both for firefighting and dousing of 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.²⁶

The PAP Maritime Police was primarily a coastal and riverine force not known for the seamanship skills of its members, as most of them originated in ground-based PAP units.²⁷ The CCG is currently building significant numbers of patrol ships from two highly capable new classes that were apparently ordered before CCG consolidation by the then-PAP Maritime Police. 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 Type 054 *Jiangkai II*-class guided-missile frigate, using an almost identical hull and likely the same powerful 2+2 CODAD (combined diesel and diesel) power plant, but with a significantly modified superstructure. This *Jiangkai II* design has proven highly reliable in PLAN antipiracy operations in the Gulf of Aden. Overall configuration of the *Zhaoduan* is similar to the *Jiangkai II* above the main deck as well, but with an additional superstructure deck 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.²⁸ However, the *Zhaoduan* does retain the same 76-mm main gun as the

Exhibit 7-4. Offshore Surveillance, Patrol, and Sovereignty Enforcement Order of Battle (Selected)

Class	Number in Country	Known Pennant Numbers	Length (feet)	Displacement (tons)	Guns (millimeter)
Zhaotou large patrol ship (WPS)	2	(Hai Jing) 2901, 3901	541	10,000+	76mm, 30mm
Zhaoduan WPS	6	(Hai Jing) 31301, 31302, 31303, 46301, 46302, 46303	450	4,000+	76mm
Zhaojun WPS	9	(Hai Jing) 2111, 3311, 3511, 3711, 4411, 4511, 4611, 4612, 4613	328	2,700	76mm
Shuoshi II WPS	4	(Hai Jing) 1501, 2501, 2502, 3501	426	5,800	76mm (prov.)
Zhaolai WPS	4	(Hai Jing) 1401, 2401, 3401, 3402	325	4,800	76mm (prov.)
Shucha II WPS	10	(Hai Jing) 1305-7, 2305-8, 3306-8	321	4,000	30mm
Hai Yang WPS (ex-People's Liberation Army Navy [PLAN])	1	(Hai Jing) 3368	345	3,325	None
Kanjie WPS (ex-PLAN)	1	(Hai Jing) 2506	425	5830	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	37mm
Shusheng WPS	5	(Hai Jian) 1010, 2115, 3015, 7008, 9010	290	1750	14.5mm (prov.)
Shuke III/III WPS	20	I: (Hai Jing) 1127 II: (Hai Jing) 1123, 1126, 2166, 3175 III: (Hai Jing) 2112, 2113, 3111, 3112, 3113, (Hai Jian) 1002, 1013, 2032, 2168, 4001, 4002, 4072; (Yu Zheng) 46016	245-265	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

Shuke I/II/III WPS	20	I: (<i>Hai Jing</i>) 1127 II: (<i>Hai Jing</i>) 1123, 1126, 2166, 3175 III: (<i>Hai Jing</i>) 2112, 2113, 3111, 3112, 3113; (<i>Hai Jian</i>) 1002, 1013, 2032, 2168, 4001, 4002, 4072; (<i>Yu Zheng</i>) 46016	245-265	1,450	None
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Shuyou WPS	3	(<i>Hai Jing</i>) 1117, 2146, 3171	242	1,000	None
Shuwu WPS	3	(<i>Hai Jing</i>) 1115, 2151, 3184	288	1,750	None
Tuzhong WPS (ex-PLAN)	3	(<i>Hai Jing</i>) 1310, 2337, 3367	278	3,300	None
Haixun II WPS	1	(<i>Hai Jing</i>) 31101	311	1,900	37mm, 23mm
Haijian WAGOR/WPS	4	(<i>Hai Jian</i>) 1118, 2149, 3172, 3174	230	1,350	None
Shuzao II/III WPG	15	II: (<i>Hai Jian</i>) 9012 III: (<i>Hai Jian</i>) 1015, 1116, 1117, 2030, 3011, 3012, 4067, 4073, 5030, 7018, 7028, 7038, 8003, 8027	215	600	12.7mm
Type 618B-II WPG	30+	(<i>Hai Jing</i>) 015,* 12001, 13101, 13102, 21101, 21102, 21103, 21104, 31102, 32102, 33101, 33102, 35101, 35102, 35103, 37101, 37102, 44101, 44103, 45101, 45102, 46101, 46102, 46105, 46106 + more	201-208	650	25mm or 30mm

* This is a training vessel subordinate to the Maritime Police Academy that is nonetheless fully combat-capable.

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 EC-135 helicopters. With the propulsion system from the *Jiangkai II* but reduced displacement at more than 4,000 tons, the *Zhaoduan* can likely attain more than 30 knots top speed, making it one of the world's fastest large coast guard ships, with a range of 10,000 nm at 15 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.²⁹

The CCG is also building the smaller Type 718 *Zhaojun*-class cutter, using what appears to be an original design. Displacing 2,700 tons, it is 328 feet long and 43 feet at beam. Its estimated maximum speed is 25 knots, and its range is 6,500 nm. At least nine of these patrol ships have been launched to date, with several already operational. 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.³⁰

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 are 650 tons, 208 feet long, and 30 feet at beam, and have a large power plant capable of about 30 knots top speed and 2,000 nm range. They are also very maneuverable. The CCG's 25-plus hulls have a 30-mm main gun and high-capacity water cannon. Some units have a fast boat launch ramp at stern.

Aside from these purpose-built border defense ships and craft, the CCG has accepted three former PLAN *Jiangwei II* patrol frigates. Missiles and most naval systems have been removed, but twin 37-mm guns and a helicopter hangar have been retained. At only 2,000 tons, 367 feet in length, and 40.7 feet at beam, their strength is a top speed of approximately 30 knots and a range of 4,500 nm at 18 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 and shoreside infrastructure. Though the precise number of CCG maritime facilities in China is difficult to determine, the CCG is thought to have more than two hundred total facilities at which ships or small craft are stationed.³¹ However, fewer than forty of these are regarded as large bases that can accommodate offshore-capable patrol ships. The rest are

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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 fisheries patrol craft with limited shoreside infrastructure. Many others host even smaller inshore patrol boats and are essentially just a small pier or jetty with a single support building (if that).³²

In recent years, the most substantial CCG bases have been expanded significantly, including much larger piers to accommodate all the new ships and substantial ashore facilities to include barracks, athletic facilities, and in some cases limited ship repair facilities. In addition, several large new CCG bases were built from scratch, replacing multiple small bases in the respective areas. Growing emphasis on ship repair shows both 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. It can be moved to different locations, including to South China Sea features, and can accommodate smaller patrol ships.

Although the CCG reform began in 2013, in most cases its facilities remain somewhat segregated based on organizational mission—that is, bases that previously hosted BOF ships continue to host ships that perform fisheries enforcement activities. It is unclear whether duplicative facilities will be eliminated in the future.³³

China Maritime Safety Administration

Not included in the 2013 CCG consolidation, the MSA remains an independent agency with its own fleet and facilities. It is responsible for controlling and securing China's maritime ports, commercial maritime traffic, aids to navigation (buoys, lighthouses, etc.), pollution control, and SOLAS, among other missions. The MSA's presence is largely limited to China's territorial waters, although it 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 the missing Malaysian Airlines flight). However, the 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.³⁴

Although considered a law enforcement agency, the MSA generally is not involved in territorial disputes (South China Sea, Senkakus, etc.), fisheries enforcement, customs, or other countercriminal activities. It maintains a good

working relationship with regional forces, including the U.S., Japan, and South Korean coast guards, and often works jointly with these forces.³⁵

China Rescue and Salvage

While not a law enforcement organization, the CRS is nonetheless a government-run agency that has a substantial presence in China's maritime realm. The CRS operates in both an official capacity (in support of SOLAS) and a commercial capacity, taking on contract work ranging from towing stranded ships to salvaging sunken ships to transporting and placing commercial oil rigs. This commercial side provides the CRS with a substantial independent budget from profits, much of which it 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 more than thirty modern rescue and salvage ships, which spend most of their time loitering in busy maritime traffic areas and roadsteads off Chinese ports. The CRS has several major basing facilities, some of which are collocated with or close to CCG or MSA facilities, but it does not generally operate or interact heavily with CCG forces.³⁶ While the CRS's large ships may be present in the vicinity of maritime disputes, they are typically only there to provide rescue in case of damage to other agencies' (or foreign) ships and do not get involved with any enforcement or deterrent activities. The CRS is highly regarded in the international maritime community due to its professional and experienced personnel, modern and highly capable fleet of ships, and lack of direct involvement in maritime disputes. Its ships are often contracted to perform transport or other work around the globe.³⁷

Conclusion

In building the world's largest coast guard, 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 allowing the PLAN to focus on naval roles farther out, with a commensurate reduction in PLAN small patrol craft over the past decade. Moreover, new CCG ships capable of long-distance operations in higher seas, the largest capable of operating

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globally, could permit extended deployments beyond East Asia (e.g., for anti-piracy or sea lines of communication escort). CCG modernization and expansion afford China presence and influence to further 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 a sharpened focus on future construction of a few (perhaps three to four) major classes and several minor classes, in order to streamline logistics and operations. Emphasis on size is giving way to emphasis on speed and filling capability gaps. The CCG will likely continue to grow numerically but is unlikely to repeat the growth rate of the past decade—primarily because China has now replaced almost all its older, less capable large patrol ships. In the coming decade, China will likely 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 lifespans. The CCG will undoubtedly focus on remedying its major remaining areas of weakness: severe rotary wing limitations (with only about fifty ships being helicopter-capable and having few helicopters); uneven crew training, with seamanship depending on former agency; and an outpacing of trained crews by ships requiring them.³⁸ To improve situational awareness, the CCG will likely 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 such regional operations will likely remain the focus for China's second sea force, larger CCG ships could increasingly 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, evolutionary ship designs, and extensive use of commercial off-the-shelf components offer China the ability to rapidly surge CCG ship construction if desired. When it comes to rapidity of fleet expansion and modernization, China's second sea force is already leading the way.

Notes

1. Andrew S. Erickson, "Numbers Matter: China's Three 'Navies' Each Have the World's Most Ships," *National Interest*, February 26, 2018, <http://nationalinterest.org/feature/numbers-matter-chinas-three-navies-each-have-the-worlds-most-24653>.
2. Ryan D. Martinson, "China's Second Navy," U.S. Naval Institute *Proceedings* 141, no. 4 (April 2015), <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
3. 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): 84, <http://digital-commons.usnwc.edu/nwc-review/vol70/iss2/5/>.
4. Japan's coast guard has about eighty hulls, South Korea's has about forty-five, and the U.S. Coast Guard has about fifty. Unless otherwise specified, all such numbers are the authors' estimates based on open sources, including *China's People's Liberation Army Navy (PLAN), Coast Guard, and Government Maritime Forces 2018 Recognition and Identification Guide* (Suitland, MD: Office of Naval Intelligence, July 2018), <http://www.oni.navy.mil/Portals/12/Intel%20agencies/PLANavy.jpg?ver=2018-07-16-090249-333>.
5. Notably, however, the Vietnamese have since modified their own ships to protect from such actions and installed their own high-capacity water cannon.
6. Tonnage and displacement are not an accurate measure of seakeeping. For example, many PAFMM boats can operate across the ocean but are below five hundred tons. And there are one thousand-plus-ton vessels that are not suited to offshore operations as well. In this chapter's tables, we group vessels into these categories for ease of readability and metrics, but in reality there is no set measure for whether a ship is "oceangoing" or "offshore-capable." The phrase "capable of operating offshore" and the numbers associated with it are the product of analysis to determine which specific ships can and cannot operate competently at significant distances from the coast. Ships that cannot operate offshore are not included, regardless of displacement.
7. The CCG lacks underway replenishment capabilities, so port access is essential when additional supplies are needed.
8. Ryan D. Martinson, "From Words to Actions: The Creation of the China Coast Guard," conference paper for "China as a 'Maritime Power,'" CNA Corporation, Arlington, VA, July 28–29, 2015, 14, https://www.cna.org/cna_files/pdf/creation-china-coast-guard.pdf.

9. Office of Naval Intelligence, "China's Coast Guard," <https://www.oni.navy.mil/Portals/12/Intel%20agencies/PLANavy.jpg?ver=2018-07-16-090249-333>.
10. Stephen A. Weber, "China's Coast Guard," <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
11. This is a 2000-ton ship.
12. Masumi Ohtsuka, "China's Coast Guard," <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
13. Fisher, "China's Coast Guard," <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
14. Xiao, "China's Coast Guard," <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
15. See, for example, "China's Coast Guard," <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
16. 孙鼎 | 中国海 | Actor (Beijing)
17. Very few ships are launched post-2010.
18. Despite the corvette's role in the BO.
19. This is the BO.
20. Lyle C. Implicke, "China's Coast Guard," <https://www.usni.org/magazines/proceedings/2015-04-o/chinas-second-navy>.
21. A tumultuous protect

9. Office of Naval Intelligence, *The PLA Navy: New Capabilities and Missions for the 21st Century* (Suitland, MD: Office of Naval Intelligence, 2015), 44–45, http://www.oni.navy.mil/Portals/12/Intel%20agencies/China_Media/2015_PLA_NAVY_PUB_Print.pdf?ver=2015-12-02-081247-687; Martinson, "From Words to Actions"; Koh Swee Lean Collin, "China's White Hull Challenge in the South China Sea," *National Interest*, January 13, 2016, www.nationalinterest.org/feature/chinas-white-hull-challenge-the-south-china-sea-14890.
10. Stephen Saunders, *IHS Jane's Fighting Ships 2015–2016*, 116th ed. (London: IHS, 2015), as well as earlier editions.
11. This term was used by most Allied military organizations during the 1990s and early 2000s to describe white hulls. "W" indicates nonnaval subordination; "AGOR" indicates an oceanographic research ship.
12. Masufumi Iida, "Maritime Expansion by China," Sasakawa Peace Foundation, October 22, 2014, <https://spfusa.org/research/maritime-expansion-by-china-as-it-pursues-changes-in-order/>.
13. Fisheries Law Enforcement has also had a very close working relationship with the U.S. Coast Guard.
14. Xiao Ming, "China Maritime Safety Administration in the New Millennium: Challenges and Strategies," diss., World Maritime University, 2000, especially 13, 21, http://commons.wmu.se/cgi/viewcontent.cgi?article=1423&context=all_dissertations.
15. See, for example, Yang Chang, "CMS Tianjin Rights Protection Law Enforcement Fleet Is Set Up" ("Zhongguo Haijian Tianjin Shi Weiquan Zhifa Chuandui Guapai"), *China Ocean News*, April 19, 2013, 4; Martinson, "From Words to Actions," 18, 44–45; Ryan Martinson, "Power to the Provinces: The Devolution of China's Maritime Rights Protection," *China Brief* 14, no. 17 (September 10, 2014), <https://jamestown.org/program/power-to-the-provinces-the-devolution-of-chinas-maritime-rights-protection/>.
16. 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, 3; Martinson, "From Words to Actions," 14; State Oceanic Administration, *China's Ocean Development Report (2013)* (Beijing: State Oceanic Administration Press, 2014), 267.
17. Very few of the new, more specialized ships were constructed post-CCG consolidation (2013). Consolidation only happened four years ago, so most ships that have been launched by now were planned and/or ordered before that happened. To date, the post-consolidation CCG has not yet received many new ships of its own.
18. Despite Internet speculation, however, the *Zhaogao* is not based on the *Jiangdao*-class corvette.
19. This refers to the same kind of joint patrols and open-ocean fisheries surveillance that the BOF has been doing for years with smaller, less capable patrol ships.
20. Lyle Goldstein, "Chinese Fisheries Enforcement: Environmental and Strategic Implications," *Marine Policy* 40 (2013): 187–93, <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1032&context=usnavyresearch>; "Fisheries Law Enforcement Command," *Global Security*, www.globalsecurity.org/intell/world/china/flec.htm.
21. A tumblehome is the narrowing of a ship's hull with distance above the waterline to protect the deck from waves.

22. "CMS—China Marine Surveillance," Global Security, www.globalsecurity.org/intell/world/china/cms.htm; "China Coast Guard," *OPLAN China Blog*, www.oplanchina.blogspot.com/p/cms-test.html.
23. China Shipbuilding Industry Corporation press releases, 2005–17, www.csic.com.cn.
24. Notably, as the *Shucha II* class became operational, the two *Shucha Is* were transferred back to SOA's scientific branch and renamed with Xiang Yang Hong prefixes versus the Zhong Guo Hai Jian and Hai Jing prefixes on the newer ships.
25. Firsthand design analysis based on photography of the MSA *Shuoshi I-* and CCG *Shuoshi II-*class ships.
26. Firsthand analysis of design, compared with CRS heavy salvage ships.
27. "People's Armed Police," *Global Security*, www.globalsecurity.org/intell/world/china/pap.htm.
28. Photography from www.cjdby.com and other web forums, compared with known configuration and design of the *Jiangkai II* frigate.
29. Sinodefence website forum and blog articles, www.sinodefenceforum.com.
30. Hobbyshanghai website forums and blog articles, www.hobbyshanghai.net.cn.
31. This is based on extensive examination of press articles, photography, and commercially available satellite imagery (Google Earth, etc.).
32. China Defense website forum and blog, www.china-defense.com. This site 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.
33. Ibid. A search of China's coastline over several years using the open source imagery program Google Earth revealed confirmed and probable base locations for CCG ships. Google Maps 2010–18 (<http://google.com/maps>) was used to determine the locality names of these bases and facilities.
34. China MSA official website (<http://en.msa.gov.cn>, various dates 2005–18) includes thousands of official press releases detailing MSA ship launches, ship orders, ship ceremonial events, operational mission details, and photography.
35. Ibid.
36. It does coordinate frequently with MSA.
37. China Rescue and Salvage official website, <http://en.crs.gov.cn>. The CRS regularly posts press releases and photography of CRS contracts, ship launches, operations, and rescue/salvage work. CRS also has multiple bureaus that maintain their own websites; details of CRS missions, basing locations, and order of battle are from Captain Song Jiahui, director-general, CRS, "An Introduction of China Rescue and Salvage," presentation at conference, Anaheim, CA, February 2009.
38. Ryan D. Martinson, *The Arming of China's Maritime Frontier*, China Maritime Studies Institute Report no. 2 (Newport, RI: Naval War College, June 2017), 9–10, 24, http://www.andrewerickson.com/wp-content/uploads/2018/04/Martinson_Ryan_The-Arming-of-China%E2%80%99s-Maritime-Frontier_China-Maritime-Report-2_Naval-War-College-CMSI-June-2017.pdf.