

PARTNERING FOR PEACE

Allies and Partners Strengthen Bonds



PLUS

New Strategies to Counter Illegal Fishing, Piracy and Transshipment



features

8 Anchored in Partnership

Indo-Pacific nations increase cooperation to combat maritime crime.

12 Patrolling the Maritime Trade Route

The People's Republic of China has ambition, but does it have the money?

16 Speaking Up for Sovereignty

Indo-Pacific nations call out the PRC's maritime aggression.

20 Weaponizing the One Belt, One Road Scheme

The PRC's nominally commercial infrastructure investments facilitate its transition to a maritime power.

24 French Maritime Security in the Indo-Pacific

Rear Adm. Jean-Mathieu Rey shares regional perspectives with FORUM.

28 Thirst for Power

Can the mighty Mekong River endure the PRC's megadams?

34 Breaking the PRC's Chokehold

India looks to new partners, maturing defense agreements to counter Chinese aggression.

38 A Strategic Nexus for Japan

Southeast Asia offers new opportunities for maritime security partnerships.

44 Illuminating Dark Fleets

Satellite images reveal illegal fishing.



48 Forbidden Catch

Illegal, unreported and unregulated fishing threatens maritime security.

52 Evolution of the Fleet

A closer look at the Chinese fishing vessels off the Galapagos.

60 A Force for Peace and Tranquility

U.S. Navy at heart of vision for Free and Open Indo-Pacific.

departments

- 4 Indo-Pacific View
- 5 Contributors
- 6 Across the Region

News from the Indo-Pacific.

64 Voice

Maritime security efforts grow in the Philippines.

66 Contemplations

Japanese asteroid samples offer promise.

67 Parting Shot



ABOUT THE COVER:

The Japan Maritime Self-Defense Force Hatakazeclass guided-missile destroyer JS Shimakaze sails in formation with a U.S. vessel from the Ronald Reagan Carrier Strike Group in November 2020 during exercise Keen Sword 21.

LT. J.G. SAMUEL HARDGROVE/U.S. NAVY



Dear Readers,

Pelcome to the *Indo-Pacific Defense FORUM*'s issue on maritime security.

As this is the first edition since I

As this is the first edition since I assumed command of the U.S. Indo-Pacific Command, I want to highlight the importance of publications like this one. As the title suggests, this is a forum for people of like-minded nations to share ideas that address some of the many challenges in this theater. In this Partnering for Peace edition, you will see the collaborative methods to meet these challenges are founded on a values-based

approach. This is fundamental to ensuring the continuation of a Free and Open Indo-Pacific.

The emphasis on maritime security highlights the importance of the Indo-Pacific theater. Its oceans, seas and waterways sustain our way of life and must be protected for all to share equally, responsibly and according to a rules-based order. This happens by building greater interoperability, information-sharing capabilities, domain awareness, and expanding cooperation with allies and partners. The United States is collaborating with like-minded people and governments to strengthen regional security institutions and reinforce an open and effective security architecture where all nations — large and small — have an equal voice and a forum for those voices to be heard.

The opening feature of this issue examines the global leadership role Indo-Pacific nations play in maritime cooperation through the lens of counterpiracy operations. Communities of states, civic organizations, and private industries in the region have joined forces to combat the threats of piracy and armed robbery at sea that have been exacerbated by the coronavirus pandemic.

Other key articles highlight how Southeast Asian nations are stiffening their resistance to the persistent coercion and aggression in the South China Sea, which threatens their maritime sovereignty and freedom of navigation. Southeast Asian nations such as Indonesia, Malaysia, and Vietnam are sensibly using diplomatic levers to counter excessive claims to the resources of the sea and valuable trade routes. A pair of articles analyzes the U.S. alternatives to China's One Belt, One Road initiative and assess China's financial capacity to achieve such ambitious transformation.

A final series of articles on illegal, unreported, and unregulated (IUU) fishing reveals the urgency for Indo-Pacific nations to generate a coordinated, international, and strategic response to this mounting threat. As China grows its distant-water fishing fleet, our response must take the vastness of this theater into account, from waters off neighboring nations such as Japan to those off shores as far away as Ecuador. IUU not only threatens resource sustainability and equity but also is inexorably linked to trafficking, drug smuggling, and other maritime crimes.

I commend our authors in this edition for proposing novel and innovative solutions to combat the many maritime security challenges facing the region. I hope these articles encourage regional conversations on maritime security, and I welcome your comments. Please contact *FORUM* staff at ipdf@ipdefenseforum.com to share your thoughts.

All the best,

J.C. AQUILINO Admiral, U.S. Navy Commander, U.S. Indo-Pacific Command

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authors an article in this issue with Mallory. Featured on Page 52

Join the Discussion WE WANT TO HEAR FROM YOU!

Indo-Pacific Defense FORUM caters to military and security personnel in the Indo-Pacific region. A product of U.S. Indo-Pacific Command, the quarterly magazine provides high-quality, indepth content on topics that impact security efforts across the region — from counterterrorism to international cooperation and natural disasters.

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NAVY—SQUAD to move to tiny islet

ndonesia's plan to site its naval combat squad headquarters on a tiny outpost far from Jakarta shows a commitment to deal with a festering maritime sovereignty dispute involving China, analysts in the region say.

The squad's Jakarta headquarters will rebase in the Natuna Islands, at a date not yet announced, so the Navy can respond more quickly to incidents at sea, Indonesia's Navy chief of staff told Radio Free Asia.

The squad enforces maritime sovereignty, including Indonesia's claims in the adjacent Natuna Sea, where Chinese coast guard vessels and fishing fleets periodically pass, rankling leaders in Jakarta. The squad commander could "directly lead the battleships in the combat force there," naval Chief of Staff Yudo Margono said.

"In general, the idea is that if there is a potential regional conflict in which the Navy's combat activities and plans have to be activated, it would be around the South China Sea," said Evan Laksmana,

a senior researcher at the Centre for Strategic and International Studies research group in Jakarta.

The squad operates four vessels and a CN-235 transport aircraft. Its relocation would fit with 15-year-old government plans for bolstering defenses on strategic outlying islands including the Natuna chain, Laksmana said. The 272 Natuna islands lie about 1,100 kilometers from Jakarta.

Indonesia's Navy has acquired more weaponry over the years, and the Coast Guard has vowed to step up patrols. Together, they must scour the seas around 13,000 islands for terrorists, pirates and illegal migration as well as vessels from the People's Republic of China (PRC) and sometimes Vietnam.

Indonesian vessels including nonmilitary units have already expelled Chinese ships from an exclusive economic zone extending as far as 370 kilometers from the Natuna chain.

Part of the Natuna Sea northwest of the islands falls within the PRC's claim to about 90% of the 3.5 million-square-kilometer South China Sea. Brunei, Malaysia, the Philippines, Taiwan and Vietnam contest Chinese claims to features in the fishing-rich, energy-loaded South China Sea that extends from the Natuna chain to Hong Kong.

The PRC has the world's third-strongest armed forces, ahead of every Southeast Asian country. Other claimant countries have modernized their navies and coast guards, sometimes with help from the United States.

"Most of the other countries have already been modernizing their naval forces anyway, so in a way Indonesia is just following the trend that's already there before," said Jay Batongbacal, international maritime affairs professor at the University of the Philippines. Voice of America News

AUSTRALIA

Security center to open in Vanuatu

A center focusing on the security concerns of Pacific island nations will start work in Vanuatu in 2021, Australia said, hosting analysts and sharing information on issues from maritime risks to human trafficking and disinformation.

The Australia-backed Pacific Fusion Centre in Vanuatu's capital, Port-Vila, will also spotlight issues such as illegal fishing, drug smuggling and climate change, Australian Minister of Foreign Affairs Marise Payne said.

In preparation, a team of 21 analysts from 14 Pacific island nations began training in the Australian capital, Canberra, in September 2019.

"It has acted as a reliable source of information for Pacific governments," Payne said, adding that the analysts advised on issues related to the coronavirus pandemic, food and border security, and combating disinformation.



The move is part of the Pacific Step Up strategy Australia announced in 2018, regarded as a bid to counter the People's Republic of China's growing influence in a region where Australia has traditionally been the largest aid donor.

"Vanuatu looks forward to working with Australia to establish the Pacific Fusion Centre, to complement and bolster existing regional security architecture," Vanuatu Foreign Minister Marc Ati said.

Reuters



AFP/GETTY IMAGES

METHAMPHETAMINE

seizure shows changing nature of

REGION'S TRAFFICKING

he Sri Lanka Navy's seizure of 100 kilograms of crystal methamphetamine in January 2021 signaled a change in the operating methods of international drug traffickers in the region, *The Hindu* newspaper reported.

Heroin was the contraband in many of the previous seizures along the coasts of Sri Lanka and India, but an Indian Customs official said methamphetamine, or meth, may be yielding bigger profits now. "Earlier, large consignments of heroin smuggled via the sea route were being intercepted off the coasts of India, Sri Lanka and the Maldives," the official told the newspaper. "The consignments originated from the Makran coast in Pakistan. This time around, meth is the main component, indicating that the stuff may now be generating more profit for smugglers."

The Sri Lanka Navy conducted the January 4, 2021, operation with its intelligence services and the Police Narcotics Bureau, *The Hindu* reported. The agencies arrested four people and confiscated 100 kilograms of meth and 80 kilograms of hashish. They also impounded a fishing trawler used for smuggling the drugs. (Pictured: In April 2020, the Sri Lanka Navy seized 605 kilograms of meth and 579 kilograms of ketamine from a flagless cargo carrier near Colombo, Sri Lanka.)

Enforcement agencies suspect that high-purity meth is being produced in large quantities in sophisticated labs in Pakistan. The labs use ephedrine extracted from ephedra plants in Afghanistan, *The Hindu* reported. FORUM Staff



n the early hours of October 26, 2020, the bulk carrier El Matador was in the eastbound shipping lane of the Singapore Strait, positioned about 3.2 nautical miles (6 kilometers) off Nongsa Point on the Indonesian island of Batam. The Cypriot-flagged vessel was navigating the strait — one of the world's busiest maritime channels — as part of its weekslong journey from the Arabian Sea port of Salalah, Oman, to Caofeidian, a port on China's Bohai Sea, when it received a shore-to-ship alert: An unknown craft had been seen alongside the El Matador.

Crew members soon spotted intruders in the engine room and raised an alarm, sending the four perpetrators fleeing from the 200-meter-long carrier. The El Matador diverted to an anchorage off Batam, where the Indonesian Navy boarded and searched before the ship resumed its voyage east, its crew unharmed and its cargo untouched.

Meanwhile, other authorities were alerted, including the Singapore Navy's Maritime Security Task Force and the Singapore Police Coast Guard, and a safety navigational broadcast was issued to warn mariners in the area.

In a matter of hours, the incident aboard the El Matador had illustrated a key finding of a major report on

maritime security: The Indo-Pacific is a global leader in maritime cooperation.

"In many regions, piracy and armed robbery at sea are considered by seafarers to be the most pressing maritime security threats," according to the 2020 Maritime Security Vessels sit at anchor in the Singapore Strait. Much of the Indo-Pacific's maritime commerce passes through the 16-kilometer-wide strait, creating a shipping chokepoint targeted by pirates and armed robbers.

AFP/GETTY IMAGES

Index published by the Stable Seas program, part of the Washington, D.C.-based nonprofit One Earth Future. "Fortunately, strong communities of states, civil society organizations, and private companies have come together to address this concern."

POSITIONED TO RESPOND

The Indo-Pacific's reputation for effectively combating piracy and other maritime crime has been earned through a yearslong approach anchored in multinational partnerships, interagency collaboration and information sharing. As such, experts consider the region well-positioned to respond to a rise in maritime crime reported in 2020 — an increase believed to be, at least in part, a

ripple effect of the coronavirus pandemic that emerged in late 2019 in Wuhan, China, and the resulting economic contraction.

The episode aboard the El Matador was one of 97 incidents, including two attempted incidents, of piracy or armed robbery against ships in the Indo-Pacific during 2020, according to the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia Information Sharing Centre (ReCAAP ISC). That was the most since 2017.

Four of the incidents in 2020 were acts of piracy, all in the South China Sea, the multinational center's annual report found. (Although each includes similar offenses, armed robbery against ships is defined as occurring within a state's territorial waters, while piracy occurs in international waters, often referred to as the high seas.) Overall, 74% of the incidents involved petty theft by unarmed perpetrators with no injuries to crew members.

The Indo-Pacific encompasses some of the world's most heavily trafficked sea routes and biggest ports, with more than half of all commercial shipping traffic traversing its waters. Much of that maritime commerce

Philippine Navy Lt. Sherwin Saluba Domingo looks through a gyro repeater aboard the U.S. Navy littoral combat ship USS Coronado during a joint counterpiracy patrol in the Sulu Sea.

PETTY OFFICER 3RD CLASS DEVEN LEIGH ELLIS/U.S. NAVY

passes through the 105-kilometer-long Singapore Strait, a narrow waterway between the city-state of Singapore and Indonesia's Riau Archipelago to the south. Singapore's port is the biggest in Southeast Asia and No. 1 globally for bunkering, or ship refueling, according to the Maritime and Port Authority of Singapore. Up to 1,000 vessels are in port at any one time, with a ship arriving or departing every couple of minutes.

At 16 kilometers wide, the strait is a shipping chokepoint, putting cargo vessels such as the El Matador





The Indo-Pacific encompasses some of the world's most heavily trafficked sea routes and biggest ports, with more than half of all commercial shipping traffic traversing its waters.

within reach of smaller shore boats. Indeed, most of the 34 incidents reported there in 2020, up three from the prior year, fit a similar pattern: A handful of perpetrators, sometimes armed with knives, boarded an eastbound bulk carrier under the cover of night. Only one incident involved injuries to the crew; stolen items included ship stores, engine spares, scrap metal and construction material.

"However, if opportunistic robbers see that they can commit crimes with impunity, the theft of ship stores today can easily escalate to more serious incidents, including confrontation with crew," Masafumi Kuroki, executive director of the ReCAAP ISC, said in releasing the report during the center's 12th Nautical Forum in January 2021. The virtual event drew about 100 participants from military and law enforcement agencies, academic institutions, shipping companies and industry associations. Presenters included the Philippine Coast Guard and the Singapore Police Coast Guard.

"Beyond vigilance, timely reporting by ships, enhanced patrol by enforcement agencies, as well as cooperation between littoral states, we believe that arrests and bringing perpetrators to justice is an essential deterrence to stop the increase of incidents," Kuroki said.

CHARTING A COURSE

The November 2006 creation of the Singapore-based center was part of an initiative described as "the first regional government-to-government agreement to promote and enhance cooperation against piracy and armed robbery against ships in Asia." As the ReCAAP ISC approaches its 15th anniversary, its 14 founding member states from North, Southeast and South Asia have been joined by six other nations: Australia, Denmark

the Netherlands, Norway, the United Kingdom and the United States. The center's partner organizations include the Asian Shipowners' Association, the International Maritime Organization and Interpol.

Its work focuses on three pillars: information sharing, such as weekly updates and special reports; capacity building, including workshops, executive programs and training videos; and cooperative arrangements, such as those with its partner agencies, as well as events including the forum and a piracy and sea robbery conference.

Stable Seas partners with governments, militaries and other organizations globally to eliminate maritime activities that facilitate and finance organized political violence. It launched its annual Maritime Security Index in 2018 to map and measure a range of issues — and the governmental and nongovernmental response to them — across more than 70 littoral nations in Africa, the Indo-Pacific and the Middle East. As "the maritime space gains attention as a theater for nontraditional security challenges and as space of increasingly important economic potential, so too does the need to empirically measure the scope of the challenges and the progress made in the maritime space," Jay Benson, a Stable Seas project manager in the Indo-Pacific, wrote in a February 2020 article for the online magazine The Diplomat.



In addition to piracy and armed robbery, the 2020 index noted, the Indo-Pacific faces challenges from the illicit maritime trafficking of drugs and wildlife products. Although kidnapping for ransom by terrorists remains a threat, it has been greatly diminished through collaborative efforts, including the trilateral maritime surveillance conducted in the Sulu Sea since 2016 by Indonesia, Malaysia and the Philippines.

"The region has been quick to respond to this form of maritime crime through initiatives such as coordinated patrols ... and increased information sharing through entities like ReCAAP," Benson wrote in The Diplomat.

MAKING HEADWAY

Like the waters of the Indo-Pacific, the region's maritime crime-fighting efforts are expansive, fusing military forces and law enforcement personnel, civilian government experts, shipping operators and data scientists. In addition to the ReCAAP ISC, these collaborative initiatives include:

- The International Maritime Bureau Piracy
 Reporting Centre in Kuala Lumpur, Malaysia,
 provides around-the-clock monitoring of shipping
 lanes worldwide. The bureau, a division of the
 International Chamber of Commerce, founded the
 center in 1992 as a conduit for reporting piracy and
 armed robbery incidents to local authorities and for
 warning shipmasters of trouble spots.
- Under its Pacific Maritime Security Program, the Australian Department of Defence has committed U.S. \$1.5 billion over 30 years to help Pacific island countries defend their sovereignty and security. The program will provide 21 Guardian-class patrol boats to 13 nations by 2023, as well as training, maritime coordination expertise and aerial surveillance capabilities to deter crime in the nations' exclusive economic zones and on the high seas.
- The Global Maritime Crime Programme, part of the United Nations Office on Drugs and Crime, supports security efforts across the Indo-Pacific, including through maritime law enforcement dialogues; visit, board, search and seizure training; and maritime domain awareness technology to identify and target illicit activity.
- The Information Fusion Centre, established in 2009 and hosted by the Singapore Navy, seeks to enhance regional maritime security through information sharing and collaboration, with international liaison officers deployed to the center alongside Singapore Navy personnel. Developed in 2019, the center's web-based portal, IRIS, provides a real-time picture of maritime activities and can be accessed via mobile device from ships at sea.
- The Southeast Asia Cooperation and Training (SEACAT) exercise, which marked its 19th iteration in mid-2020 as a virtual symposium due to the COVID-19 pandemic, brings together

military personnel from Europe, the Indo-Pacific and North America to boost maritime security through multilateral coordination. SEACAT 2020 focused on bolstering maritime domain awareness capabilities. "Whether it's states concerned with direct state-to-state violence in the South China Sea or everybody else concerned with overfishing, piracy and counterterrorism, this is the nexus where all those diverse security interests collide," said keynote speaker Gregory B. Poling, director of the Asia Maritime Transparency Initiative at the Center for Strategic and International Studies.

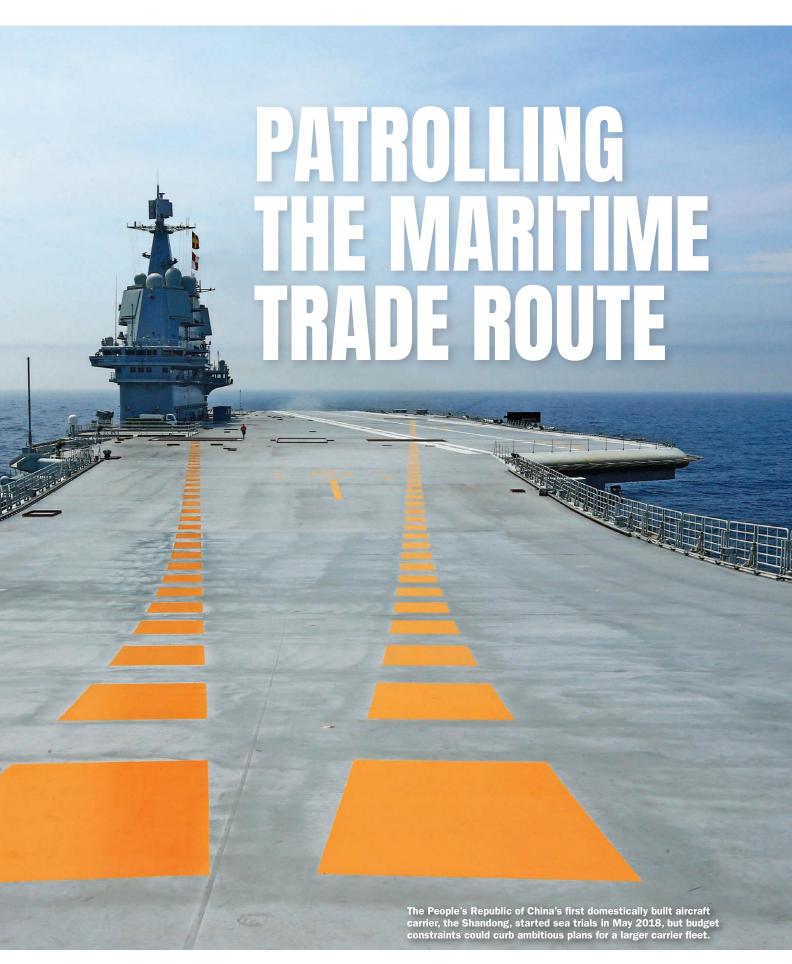
Turning the tide of maritime crime also calls for addressing its root causes, including economic and governance factors, experts contend. "Holistic approaches which connect military and naval responses with development and capacity building efforts are most likely to undermine the socioeconomic conditions which currently drive coastal populations to commit these crimes," the Maritime Security Index noted. "Similarly, onshore stability and strong national rule of law are linked to low levels of piracy and armed robbery; piracy incidents are less likely in states with strong economies and governments, and where efficient law enforcement exists."

The turbulence of 2020, with its brutal pandemic, lingering lockdowns and lost jobs, may partly account for the rise in piracy and armed robbery incidents, Kuroki told Nautical Forum attendees. "The economic hardships caused by COVID-19 to coastal communities could lead to more people resorting to sea robberies," he said. "It is also possible that prolonged work of crew on board ships, due to the difficulty of crew changes, causes fatigue to the crew and may reduce their vigilance."

The latter part of that testing year brought some welcome relief, however, as Indo-Pacific nations resumed maritime exercises that had been scuttled by virus-related travel restrictions and quarantines. In November and December 2020, for example, U.S. Coast Guard instructors conducted small boat operations training for Philippine Coast Guard members in Manila. It was the U.S. Coast Guard's first training event in the Philippines since the pandemic began.

Such cooperation and information sharing among partners lies at the heart of the Indo-Pacific's world-leading maritime security efforts, organizations such as the ReCAAP ISC and Stable Seas contend. The shore-to-ship alert that averted further danger aboard the El Matador in late October 2020 was issued through the Singapore Maritime and Port Authority's vessel traffic information system, which taps advanced technology to monitor and manage the thousands of ships that pass through the strait.

"To combat piracy and armed robbery," the Maritime Security Index noted, "it is crucial for governments, navies, and the shipping industry to share information."



THE PEOPLE'S REPUBLIC OF CHINA HAS AMBITION, BUT DOES IT HAVE THE MONEY?

SALVATORE BABONES | PHOTOS BY AFP/GETTY IMAGES

he newly installed Chinese Communist Party chief, Xi Jinping, visited Central Asia in September 2013 to attend the annual summit of the Shanghai Cooperation Organization, a political, economic and security alliance that at the time included Kazakhstan, Kyrgyzstan, the People's Republic of China (PRC), Russia, Tajikistan and Uzbekistan. Along the way, he dropped in at Nazarbayev University in Kazakhstan, the eponymous university founded by Kazakh strongman Nursultan Nazarbayev. There, Xi gave the kind of speech that will be familiar to anyone who has attended such events in the post-Cold War world, emphasizing that youth are the future, people-topeople ties will preserve global peace and what the world needs now is win-win cooperation. To these second-world shibboleths, Xi added a principle that is obligatory when speaking in Central Asia: a call for the revival of the ancient Silk Road.

"Silk Road" wasn't even in the title of the speech, which the Chinese Ministry of Foreign Affairs still calls the "Promote Friendship Between Our People and Work Together to Build a Bright Future" speech. It also wasn't the first New Silk Road. Then-U.S. Secretary of State Hillary Clinton launched a U.S. New Silk Road infrastructure strategy in July 2011 with the support of U.S. Army Gen. David Petraeus and U.S. Central Command.

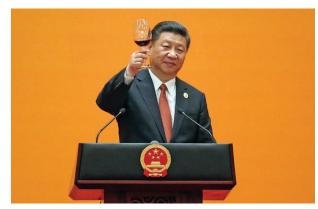
The PRC's New Silk Road caught the imagination of academics and the media, however, prompting Xi and his Foreign Ministry to transform a platitude into a pronouncement. When Xi traveled to Jakarta, Indonesia, in October 2013 to give a speech to the Indonesian parliament, the Silk Road took center stage. China would have not just one Silk Road but two: the Silk Road Economic Belt across Central Asia and the 21st Century Maritime Silk Road to Southeast Asia, the Indian Ocean, the Middle East and East Africa.

The terrestrial "belt" caught the world's imagination, but the maritime "road" attracted far more of the PRC's diplomatic, financial and military resources. In fact, the land route between Europe and China is wildly uneconomical, but the sea lanes connecting China to Singapore, Australia, the Persian Gulf, the Suez Canal and Western Europe are crucial

for the PRC's survival as a trading nation. Were the route around the bottom of Eurasia ever to be shut down, the United States economy would endure. The PRC's would be strangled to death.

Thus, it should come as no surprise that as reform-era China has been transformed from a continental empire into a trading nation, it should seek command of the seas through which its imports and exports flow. The PRC's ambition is to secure its trade against interference from the U.S., but intelligent Chinese theorists understand that to be a 22nd century ambition. In the meantime, the PRC could face many other potential threats: an Indian blockade, a conflagration at the Strait of Hormuz or even a closure of the Suez Canal. Chinese-sponsored development projects in South Asia and East Africa have given the country more reasons to prepare for potential military intervention across the region. Although the People's Liberation Army (PLA) Navy is still far from being able to challenge the U.S. Navy globally, it might hope to interfere with U.S. operations, particularly through submarine warfare.

The PRC certainly has the motive to militarize the Maritime Silk Road, and its promises of extravagant no-strings-attached foreign aid to governments in the region give it the opportunity. However, what about the means? Will the PRC really be able to develop the naval forces needed to project power into the Indian Ocean and beyond? Perhaps more important, can it afford to?



Chinese Communist Party General Secretary Xi Jinping makes a toast during a welcome banquet for the Belt and Road Forum at the Great Hall of the People in Beijing in May 2017.



Based on ambitions and announcements, the answer to both questions would seem to be yes. The PRC has two aircraft carriers and another under construction. Its third carrier will feature electric, integrated power system propulsion of the type used on the U.S. Navy's advanced Zumwalt-class destroyers. Its fourth will be nuclear-powered, featuring an electromagnetic launch system, fifth-generation stealth fighter planes and a railgun. Each of the PRC's aircraft carriers will be surrounded by a full battle group, complete with destroyer escorts, attack submarines and support ships. At least, that's the ambition.

The reality of the PLA Navy is much more mundane. It possesses a former Soviet converted cruiser (the Liaoning), which is essentially a training ship, an indigenous copy (the Shandong), which spends its time sailing between the East and South China seas, and an underpowered air wing that can only take off from carrier flight decks by shedding fuel and armaments. The PRC suffers from a chronic lack of aerial refueling capacity, which limits Chinese carrier-based aircraft to operations within a narrow radius of their home ships. Future generations of carriers and aircraft may solve these problems, but news reports suggest that the PRC has already decided to scale back its third and fourth carriers from electric and nuclear power, respectively, to steam propulsion. Plans for the fifth and sixth carriers have reportedly been scrapped.

Although the PRC's military ambitions remain undiminished, its fiscal resources have become increasingly constrained. Government budget figures, while suspect, are perhaps indicative. Throughout China's period of rapid growth from 1980-2015, the consolidated (central and local) government budgets tended to show a deficit, but revenue growth was so rapid that each year's spending levels were eclipsed by the next year's tax receipts. For example, the PRC's 2015 outlays of 15.2 trillion yuan (U.S. \$2.34 trillion) outstripped its 2015 revenues of 14 trillion yuan (U.S. \$2.15 trillion) but were themselves covered by China's 2016 revenues of 16 trillion yuan (U.S. \$2.46 trillion). Double-digit revenue growth meant that all budget constraints were soft, since China's leaders knew that the money to pay for today's promises would be available soon, if not tomorrow.

All of that changed after 2016, when spending continued to increase but revenue started to level off. Annual revenue growth, which used to average about 20%, has recently fallen into the low single digits if official figures are to be believed. All of this was before the coronavirus pandemic. Given that aircraft carriers and their air wings and associated battle groups are some of the biggest defense expenditures, it should come as no surprise that the Chinese government might seek to economize. Even if the PRC can master the technical challenges of developing nuclear aircraft carriers, it may blanch at the expense of building them, never mind equipping them.



People's Liberation Army personnel attend the opening ceremony of the People's Republic of China's military base in the East African nation of Djibouti in August 2017.

It's the same story with the PRC's much-hyped "string of pearls" around the Indian Ocean. There is no doubt that the PRC has the strategic ambition to ring the region with naval, air and electronic warfare bases. It has already spent vast sums militarizing the South China Sea, building artificial islands on which it has installed harbors, runways and radars. The South China Sea, however, is close to home, and the land acquisition cost for these bases was nil (the land creation costs are another matter entirely). Overseas bases in sovereign countries are potentially much more costly.

Consider China's only major overseas military base, in Djibouti. Nominally, this East African base cost the PRC about U.S. \$20 million a year to lease the land, plus construction costs. This seems to compare favorably with the U.S. lease terms of U.S. \$63 million a year for a much larger footprint. For the U.S., the contract terms represent the full cost: Countries such as Djibouti value U.S. bases for the implicit security guarantee they provide. The PRC, by contrast, must pay countries much more to persuade them to allow a Chinese military presence. In the case of Djibouti, that includes U.S. \$590 million for a port, U.S. \$490 million for a railway and U.S. \$450 million for an airport.

It's the same story in Pakistan, where the Chinasponsored Gwadar Port project lacks any real commercial rationale. Reportedly priced at over U.S. \$1 billion, it's unclear how much the PRC has actually spent on Gwadar. When and if it is finished, the port may become a refueling point for Chinese naval vessels or a base for Chinese marines. Whatever use the PRC finds for Gwadar, it certainly won't justify the cost. The same might be said for the underused Hambantota port in Sri Lanka and the prospective Kyaukpyu port in Burma, each with a price tag upward of U.S. \$1 billion. Taken together, these three Indian Ocean pearls cost the PRC more than U.S. \$3 billion before a single PLA Navy ship has had the chance to use them. Yet instead of resolutely pushing forward to future development phases, the PRC is in all three cases demanding additional contributions from the host countries.

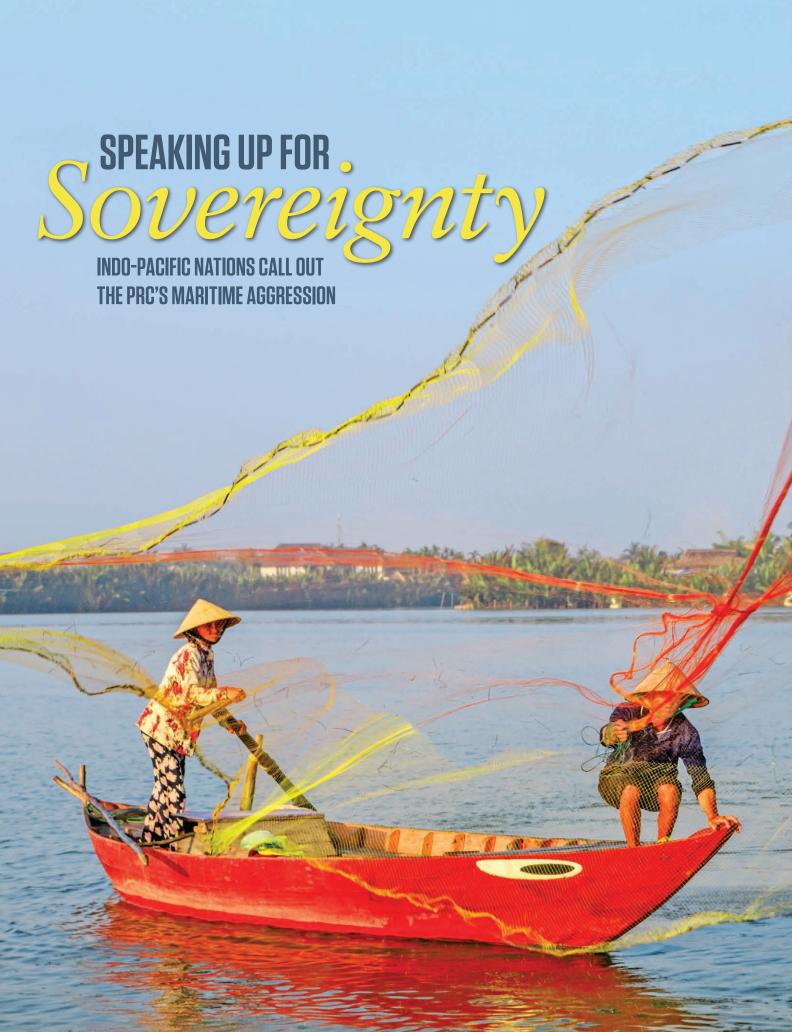


Engineers from China and the African country of Côte d'Ivoire work on the construction site of a container terminal at the port of Abidjan in March 2019.

As the PRC's economy has stalled, the country's leadership can no longer make outlandish spending commitments, confident that future growth will generate the resources needed to make good on past promises. For the first time in four decades, the PRC faces hard budget constraints. At a time when the PRC is allowing strategic firms such as semiconductor designer Tsinghua Unigroup and carmaker Brilliance Auto to default on bond payments, it is clear that state subsidies are no longer as forthcoming as they once were. The Chinese government is starting to make the difficult choices about spending priorities that other governments have long been used to, and the military budget is not immune.

The seriousness of the China challenge has always been premised on the PRC's seemingly bottomless military budgets and its penchant for rapid technological upgrading. Today's PLA Navy is primarily a small-ship force, consisting of large numbers of relatively simple, inexpensive destroyers, frigates and corvettes. Like the Soviet Union's once-mighty 1,000-ship navy, it's a fleet on the cheap. To challenge the U.S. Navy, or even to emulate the U.S. Navy's capacity to project power far beyond America's shores, the PLA Navy would require an extraordinary long-term financial commitment from the Chinese government.

In isolation, that's a commitment the PRC could probably afford. In the context of its many other military and diplomatic commitments, it is perhaps not first on the PRC's list. The PRC could only afford to dominate the maritime trade route if it gave up on other budgetary priorities, such as jet fighter development, anti-ship ballistic missiles, artificial intelligence and the space program. At the same time, the U.S.-China tech war has catapulted indigenous semiconductor development, which will be costly, to national defense priority No. 1. That's not to mention the myriad financial emergencies looming in China's banking sector. Given that kind of competition, the militarization of the Maritime Silk Road, however desirable to PRC military planners, might just have to wait. □





ersistent aggressive behavior by the People's Republic of China (PRC) in the South China Sea is galvanizing Southeast Asian nations to defend their maritime sovereignty, other rights and freedom of navigation. Although confronting an economically powerful neighbor requires a careful balancing act, nations that ring the South China Sea have been shoring up maritime defenses, speaking out against aggression and defending their territorial waters.

Vietnam, which chaired the Association of Southeast Asian Nations (ASEAN) in 2020, rallied the defense ministers of member nations in a December 2020 declaration that called for the region to "exercise self-restraint in the conduct of activities and avoid actions that may further complicate the situation, and pursue peaceful resolution of disputes, without coercion, in accordance with international law."

The 10 ASEAN members as well as the PRC and the United States agreed to the declaration. It did not mention the South China Sea. Vietnam took the message a step further, however, with a news release that said the ministers agreed "to use peaceful means and abide by the international law to settle divergent issues, especially the issues related to disputes over territory and sovereignty, including disputes in the South China Sea."

In an era in which the PRC is militarizing artificial features in the South China Sea, illegally fishing in other countries' territorial waters and exclusive economic zones (EEZs) pressuring neighbors not to extract natural resources, the unspoken target of the message was clear. For Vietnam, defending its natural resources and territorial waters is an act of survival, one expert said. "The South China Sea is almost an existential issue for Vietnam," Derek Grossman, a senior defense analyst for the Rand Corp., told *FORUM*.

Pushing back against its larger neighbor, however, is difficult for Vietnam. "On one hand, China is certainly an adversary of Vietnam in the South China Sea," Grossman said. "Vietnam is also very suspicious of the One Belt, One Road [infrastructure scheme] and the damming of the Mekong River and how that affects Vietnam in the lower Mekong Delta."



Yet, the PRC is what Vietnam refers to as a comprehensive strategic cooperative partner, which is the highest distinction it gives a foreign country. The PRC is also Vietnam's No. 1 trading partner. "They realize that China isn't going anywhere in the region," Grossman said. "It's a careful balancing act that Vietnam needs to play."

Vietnam has quietly endorsed the U.S. strategy of a Free and Open Indo-Pacific because it takes a hard line against Chinese aggression in the South China Sea "and suggests Washington's intent to sustain a presence in the region for years to come," Grossman wrote in a January 2021 article for the online news magazine The Diplomat.

COSTLY INTERFERENCE

Chinese interference with Vietnam's oil exploration in the South China Sea has already exacted a financial toll. Vietnam paid a total of U.S. \$1 billion to two international oil companies after canceling their South China Sea projects due to pressure from the PRC, The Diplomat reported in July 2020.

Vietnam's state-owned energy company, PetroVietnam, was expected to pay Repsol of Spain and Mubadala of the United Arab Emirates. Two of Repsol's development prospects were at the edge of Vietnam's EEZ but within the legally unfounded nine-dash line claimed by Beijing. Vietnam's decision to cancel the contract came after the PRC assembled 40 naval ships off the coast of Hainan island, which is a two-day voyage from the drilling site.

Vietnam has not lost its desire to extract resources within its EEZ, however. It is working with the Japanese energy firm Inpex on a deal to drill in offshore fields. The move will surely be contested by the PRC, the *South China Morning Post* newspaper reported in January 2021.

An official with PetroVietnam, who declined to be named, told the newspaper he believed that drilling would

begin in 2021. "We have calculated the reaction from China, but we have not done anything wrong. We will just drill within our exclusive economic zone," he said.

A RARE REBUKE

Malaysia is also speaking up to defend its maritime rights. The country's foreign minister announced in August 2020 that Malaysia had submitted a document to the United Nations to clarify its rights over the remaining portion of the continental shelf beyond 200 nautical miles from the country's baselines, Minister of Foreign Affairs Hishammuddin Hussein told

Parliament in August 2020, Bloomberg reported.

"Malaysia opposes China's claim that they have historic rights over those waters," Hishammuddin said. "The Malaysian government also considers China's claims over maritime features in the South China Sea to have no basis whatsoever under international law." The rebuke was an unusual move by Malaysia, which had avoided criticizing the PRC by directing its comments toward ensuring that the waterways remain open for trade, Bloomberg reported.

The PRC has constructed military bases and outposts on reefs, rock formations and shoals and claims it has rights to almost 80% of the South China Sea. Brunei, Malaysia, the Philippines, Taiwan and Vietnam claim parts of the same area. An international tribunal in 2016 rejected most of the PRC's extensive claims as inconsistent with international law.

Although Malaysia's economy remains tightly connected to the PRC, it is working with defense partners to defend its maritime interests. It is one of four Indo-Pacific militaries that will receive unmanned aerial vehicles (UAVs) from the United States to patrol and conduct reconnaissance over the South China Sea. Malaysia received six ScanEagles in May 2020 and will eventually receive a total of 12, while Indonesia and the Philippines will receive eight apiece. Vietnam is scheduled to receive six. All recipients said they will use the UAVs to support maritime security in the South China Sea.

The U.S. is fully funding the program at a cost of about U.S. \$1.4 million per vehicle. Delivery of the six remaining UAVs to Malaysia and the 22 bound for the other countries is expected by 2022.

INDONESIA STANDS UP

When Indonesia's Maritime Security Agency intercepted a Chinese survey ship in its EEZ in January 2021, it was



Then-Vietnamese Prime Minister Nguyen Xuan Phuc, center, speaks to foreign ministers attending an Association of Southeast Asian Nations meeting in September 2020 that touched on rising tensions in the South China Sea. THE ASSOCIATED PRESS



merely the latest encounter in a string of conflicts with Chinese vessels over the past few years. The Xiang Yang Hong 03 had turned off its tracking system, so Indonesian government vessels escorted it out of Indonesia's EEZ, Radio Free Asia (RFA) reported.

"If they had sailed continuously without carrying out suspicious activities, it wouldn't have been a violation. But during this voyage, their AIS [automatic identification system] was turned off, and this raised suspicion," First Adm. Suwito, director of operations for Indonesia's Maritime Security Agency, told reporters. "We asked why the AIS was turned off, and their answer was that it was broken."

Indonesia has had multiple standoffs with the PRC over allegations that Chinese fishing boats, escorted by Chinese coast guard ships, operated in its EEZ off the Natuna Islands. The Indonesian Coast Guard has been hardening its defenses as the conflicts persist. In early January 2021, Indonesia acquired 20 submachine guns for 10 patrol boats, RFA reported. In addition to the 12.7 mm guns, the Coast Guard has also received approval from the Ministry of Defense to purchase 30 mm submachine gun systems for shipboard defense.

LIKE-MINDED PARTNERS

Southeast Asian nations also rely on international defense partners to enforce the sovereignty of their maritime domains. In April 2020, the Australian warship HMAS Parramatta conducted exercises with the U.S. Navy in disputed waters of the South China Sea. The U.S. Navy sent three of its warships to the South China Sea "in support of security and stability in the Indo-Pacific region."

The deployment occurred during a period of heightened tensions. Only days before, the PRC had set up administrative bodies on islands in the South China Sea and had a month earlier launched two new research stations on artificial reefs in territory claimed by the Philippines and others.

In the context of those controversial actions, nations in the region welcomed the stinging condemnation in July 2020 of the PRC's maritime claims by then-U.S. Secretary of State Mike Pompeo, Grossman said.

"The world will not allow Beijing to treat the South China Sea as its maritime empire," Pompeo said in the statement. Newly confirmed U.S. Secretary of State Antony Blinken voiced a consistent stance when he spoke with Philippine Foreign Minister Teodoro Locsin in late January 2021. "Secretary Blinken pledged to stand with Southeast Asian claimants in the face of PRC pressure," the U.S. Department of State said in a news release.

South China Sea nations engaged in maritime disputes with the PRC appreciated the support, defense analyst Grossman said. In the case of Vietnam, the country "probably felt just more confident that the U.S. planned to support Hanoi in defending Spratly Island claims within its EEZ. Significantly, Washington specifically highlighted Vanguard Bank — the scene of the last major China-Vietnam standoff in 2019 — as indisputably part of Vietnam's EEZ," Grossman wrote in The Diplomat.

Grossman told *FORUM* that Vietnam would like to see a long-term engagement from the U.S. in the South China Sea and that leaders were pleased with the statements by U.S. leaders. "Even though Vietnam could not vocalize its ecstatic response to Pompeo's announcement, it's clear Vietnam was privately happy about that," Grossman said.

The strategy of a Free and Open Indo-Pacific requires allies and partners to work together to keep international sea lanes open and territorial waters protected, he said. "I think that's the U.S. hope, and the Free and Open Indo-Pacific strategy lays that out. The U.S. wants like-minded partners who are also facing Chinese assertiveness in the South China Sea. That's where the rubber meets the road."



THE ONE BELT, ONE ROAD SCHEME

THE PRC'S NOMINALLY COMMERCIAL INFRASTRUCTURE INVESTMENTS FACILITATE ITS TRANSITION TO A MARITIME POWER

DANIEL R. RUSSEL AND BLAKE H. BERGER

espite the People's Republic of China (PRC) branding it as an economic and development initiative, the One Belt, One Road (OBOR) investment scheme is, in fact, the embodiment of a whole-of-government effort to develop the "close coordination between military struggle and political, diplomatic, economic, cultural and legal endeavors" that Chinese Communist Party (CCP) General Secretary Xi Jinping has called for to foster a strategic environment conducive to China's rise.

Integrating the civilian and military sectors is a pillar of the CCP's defense policy strategic framework. It allows China to obtain benefits from national defense resources in peacetime and from civilian infrastructure projects in the event of conflict.

Given that Xi has championed the "unified military-civil system of strategic capability," it should come as little surprise that major components of OBOR infrastructure, including the port-park-city model, the digital silk road and the space information corridor, are designed with dual-use features that bolster a range of potential military and intelligence capabilities.

Beijing's win-win rhetoric about the peaceful and benign nature of OBOR notwithstanding, a deliberate military and strategic functionality seems clearly entrenched in the program. The security challenge to United States or regional interests, however, does not lie in the risk of a string-of-pearls-type chain of overseas coastal fortifications from which the People's Liberation Army (PLA) can wage war and that it will defend.



A Chinese port terminal on Made Island near Kyaukpyu, Burma, is a strategic strongpoint that bolsters the People's Liberation Army's ability to safeguard the Malacca Strait, a critical chokepoint, and offers valuable logistics support in the Indian Ocean. REUTERS

There is little evidence so far of the PRC constructing full-blown overseas military bases on the U.S. model, but there is abundant evidence that it is developing a network of strategic strongpoints that can significantly raise the costs of any U.S. military intervention and lower the willingness of OBOR host governments to offer the U.S. access or assistance.

This network, embedding the military within the civilian, harnesses financial, technological, trade and development tools in service of strategic and defense



goals. It directly supports PLA power projection through enhanced operational, logistics and information network capabilities centered on OBOR platforms. It aims at creating an environment conducive to CCP interests and inhospitable to those of the U.S.

The gains to the PRC from OBOR-related leverage come largely at U.S. expense. They are, as a former U.S. defense official put it, "a suite of capabilities that are intended, clearly ... to defeat American ... power projection."

DIGITAL COUNTERMEASURES

China's technological exports under the digital silk road and widespread adoption of the Beidou satellite network are important components of this suite of capabilities. When Chinese technologies such as fiber-optic cables and 5G networks are baked into OBOR packages, host states' de facto reliance on Chinese companies increases exponentially. In addition to promoting digital governance with Chinese characteristics, the spread of Chinese technology, particularly tools for surveillance and repression, favors authoritarian regimes — governments with which Washington is more likely to clash over undemocratic behavior.

Not only does this disadvantage the U.S. and its companies as well as its allies and partners, it also strengthens the PRC's ability to seize and cement advantages by setting the standards for next-generation technology. Thus far, U.S. countermeasures such as the Digital Connectivity and Cybersecurity Partnership

announced in 2018 with a modest U.S. \$25 million budget are woefully inadequate.

The nascent trend seems to be toward an increasingly Chinese-dominated political, economic, technological and strategic ecosystem in the Indo-Pacific. If there is a challenge posed by OBOR for the U.S., it lies not in enhanced PLA capabilities per se, but in the CCP's enhanced ability to project its sovereignty, rules or undue influence based on a unilateral assertion of core interests. The exercise of this power will challenge the U.S.-led open, rules-based international order.

Should the PRC be successful in leveraging OBOR for preeminence in the Indo-Pacific, the U.S. role as the guarantor of regional peace and stability would be undermined. Movement toward a Sino-centric regional ecosystem represents a fundamental change in the regional balance of power between the PRC and the U.S.; there have been echoes of a "sphere of influence" strategy in Xi's public statements calling for "Asia for Asians." It is implicit in his pledge to build a "new architecture of regional security cooperation that reflects Asian needs."

The PRC's creation of regional multilateral for athat exclude the U.S. indicates that it is laying the foundation for a more China-centric regional security and economic order. This, in turn, would have significant implications for the international rules-based order.

It is by no means a foregone conclusion that this nascent ecosystem underpinned by OBOR will ultimately be realized. It is true that U.S. policies and diminished diplomatic engagement in the region over the past several years have not aided the U.S. cause. Yet, the CCP confronts a range of countervailing forces that could derail its plans. The CCP is not offering a global vision that other countries seem eager to embrace. The PRC's double-digit growth has steadily slowed, and the aftereffects of the COVID-19 pandemic reduce the resources that the CCP can bring to bear.

DECLINING ECONOMIC VIABILITY

The PRC's economic conditions are vastly different today than in OBOR's first five years, making unclear how financially and politically feasible it will be for the CCP to pump massive capital into the plan. OBOR projects have rarely proven commercially profitable, and the global economy, ravaged by the pandemic, exacerbates this problem.

Despite the drums of increasing military-civilian fusion, developers in some cases have either not followed plans or cut corners in port construction, resulting in maritime assets that may not meet PLA standards. Some OBOR projects have been halted or scrapped, and others will languish on the drawing board as host countries retrench financially.

Many OBOR host states are unable to service their existing debts to the PRC, presenting the Chinese government with an unpalatable choice between the expensive options of debt forgiveness or restructuring at a time when the PRC's economy is distressed versus pressing for repayment or another form of compensation — risking criticism for "debt-trap diplomacy" and local backlash.

While the PRC has gone along with a G-20 moratorium on debt service payments by the world's poorest countries, mostly in Africa, it does not have a similar policy on OBOR debt. Pakistan, which has already requested relief on U.S. \$30 billion in loans, is a high-risk borrower, according to an Organisation for Economic Co-operation and Development classification.

So, too, are other major OBOR host countries such as Bangladesh, Laos and Sri Lanka. Chinese officials, acknowledging that debt relief is not simple, have ruled it out for preferential loans made by China's Export-Import Bank, which has financed more than 1,800 OBOR projects worth an estimated U.S. \$149 billion.

Other officials have cautioned that "OBOR loans are not foreign aid" and made clear that the PRC expects to recoup its principal plus at least modest interest.

MOUNTING BACKLASH

The PRC's OBOR projects have long sparked concerns in host countries over issues ranging from corruption and land grabs to environmental damage and worker rights and safety. Assertive Chinese government behavior toward neighbors over territorial disputes has generated mistrust and resentment in the region.

Heavy-handed wolf warrior diplomacy has undercut the PRC's claim to be a benevolent and peaceful rising



As part of its One Belt, One Road scheme, the People's Republic of China seeks to export its smart cities and smart ports programs, whose networked cameras, pictured in Hong Kong, sensors and location services can be used for legitimate policing or for repression. REUTERS

power. Exploitative behavior by Chinese companies in Africa has fueled resentment and, in some cases, a violent backlash against Chinese workers. It stands to reason, therefore, that a hard push by the CCP on debt repayment by cash-strapped states in a global recession caused by a pandemic that originated in China is unlikely to sit well with partner countries and could undermine the PRC's image and strategy.

Criticism of OBOR emanates not only from project hosts and concerned states but also more frequently from the Chinese population itself. As the PRC's economy suffers and its population feels the pinch from the U.S.-China trade war and the fallout from COVID-19, Chinese citizens have increasingly taken to the internet to voice displeasure at these loss-making grand projects.

Chinese academics, economists and businesspeople have argued that the resources being dedicated to OBOR could be put to better use at home. Whether the PRC can effectively "weaponize" OBOR by creating a Sino-centric ecosystem of trade, technology, finance and strategic strongpoints — undermining U.S. influence and its role as a security guarantor — will be a function of CCP choices — and those made in Washington as well.

The ability of the U.S. to serve as an active and credible partner across multiple sectors and regions seems a necessary precondition for OBOR target countries to resist the Chinese carrots-and-sticks strategy. It will also be a function of the ability of like-minded Indo-Pacific states, including Australia, India, Japan and Association of Southeast Asian Nations members, to contribute and provide practical alternatives to what the PRC is offering. □

This article is excerpted from the Asia Society Policy Institute's report "Weaponizing the Belt and Road Initiative," published in September 2020. It was edited to fit FORUM's format.



Rear Adm. Jean-Mathieu Rey shares regional perspectives with FORUM

As a de facto Pacific nation, France is concerned with issues in the Indo-Pacific.

Its territories in the region are home to 1.6 million people, and 200,000 French citizens live in Indo-Pacific countries, Rear Adm. Jean-Mathieu Rey, the French joint commander of the Asia-Pacific maritime zone, known as ALPACI, and the Armed Forces in French Polynesia, told FORUM. Rey served at sea for 25 years, mainly in the Indo-Pacific. A graduate of the Higher Command and Staff Course in the United Kingdom and French equivalent courses, he held positions ranging from commando platoon leader, patrol boat commander and frigate commander to chief of staff of the carrier strike group Charles de Gaulle and commander of the air defense destroyer Forbin. Detached to the Foreign Affairs Ministry, he was also advisor for security and defense cooperation in Asia and South America. From 2017-2020, he served as deputy director of Fleet Service Support, overseeing operational preparation of surface ships, nuclear submarines and aircraft carrier.

How big is the French exclusive economic zone (EEZ) in the Pacific?

France has the second-largest EEZ in the world. Among its various regional EEZs, the French Pacific EEZ is the largest with 6.8 million square kilometers distributed around four hubs between Australia and Mexico. They include Clipperton, French Polynesia, New Caledonia, and Wallis and Futuna.

How is the EEZ controlled?

Because of its size, sea surveillance and control of this EEZ are a real challenge. Protection of the EEZ encompasses four main missions: maritime safety (search and rescue, vessel traffic monitoring); environment protection (oil spill response and readiness); maritime security (law enforcement, counterterrorism); and suppression of illegal activities (illegal, unreported and unregulated (IUU) fishing, and human, narcotics or weapons trafficking).

What assets do the French Armed Forces use?

The French Armed Forces in the Pacific are equipped with versatile assets such as surveillance frigates, patrol ships, high seas support and assistance ships and coastal tugboats. Aircraft such as the Falcon Guardian, Casa and Dolphin helicopters are used as well. Moreover, surveillance by satellite allows wide areas to be covered.

For coast guard missions, I coordinate the action of all the sea-related services and agencies such as customs, maritime affairs department, gendarmerie, national police and Polynesian administration, which is in charge of maritime resource protection. In 2011, a Maritime Inter Agency Centre was created to improve maritime surveillance. It is composed of three cells, respectively in charge of fusion of information, fishing surveillance, and search and rescue.

Is France's maritime presence limited to the French EEZ?

No. Maritime security threats are not limited by national maritime limits, and I am convinced that we have to adopt a global approach to address Pacific maritime challenges.

With 7,000 to 10,000 defense personnel, France is the only European state to maintain a permanent military presence, which underlines its regional commitment and global ambition. The military organization relies on two regional commands: one for the maritime zone of the Indian Ocean in Abu Dhabi, known as ALINDIEN, and mine in Papeete for ALPACI. In addition, three local commands in Djibouti, La Reunion and New Caledonia provide assets and forward support on a regular basis, while protecting their dedicated EEZs.

In this framework, you will understand that I do not intend to limit French action to French EEZs. As a nuclear power and permanent member of the United Nations Security Council, France is fully involved in dealing with regional maritime threats and crisis prevention. Military assets permanently based in the Pacific can easily be reinforced by vessels or aircraft coming from mainland France. For example, the French carrier strike group operated in the

area in 2019 when carrier vessel Charles de Gaulle made a port call at Singapore during the Shangri-La Dialogue, and French long-range aircraft offered critical support in the Pacific during the COVID-19 crisis. Other deployments, including our amphibious task group, destroyers or maritime patrol aircraft, are planned and will be renewed each year. Even if we deal with maritime concerns, an interagency approach is fundamental to reach operational effectiveness.

The armed forces under my command also deal with nuclear proliferation in North Korea, with freedom of navigation at sea and by air in the commons, and with multilateralism.

What are the main challenges in the area?

To defend freedom of navigation is paramount. Maritime security all over the world is based on the United Nations Convention on the Law of the Sea (UNCLOS), which aims to preserve freedom of navigation. France's naval commitment across the Pacific intends to promote and defend this international rules-based order. UNCLOS was negotiated for a long time among more than 150 countries. In 1982, at Montego Bay, Jamaica, they came up with an agreement on the best compromise between the right of coastal states to exploit maritime resources and the historic principle of freedom of navigation outside territorial waters. I think we all have to defend and promote this compromise.

Maritime security challenges cover numerous and various topics, including piracy, IUU fishing, climate change, illegal trafficking and refugees.



Narcotics trafficking is of high importance. How does France act against it?

To counter drug traffickers, our strategy at sea consists of:

- 1. Monitoring inflows and outflows, especially slow movers, sailing boats or fishing vessels coming inside or leaving our maritime area.
- 2. Analyzing maritime databases to detect weak signals.
- 3. Sharing maritime information with national and foreign partners, in particular, the United States Joint Interagency Task Force West and Joint Interagency Task Force South.

When all of these pieces of information lead to an intervention, I am responsible for the coordination at sea of all services concerned (gendarmerie, customs and prosecutor).

Thanks to this strategy, French assets seized more than 5 tons of cocaine from ships on their way from Central America to Australia/New Zealand between 2016 and 2020. Hundreds of ships were also checked by gendarmerie and customs units.

Many Indo-Pacific countries worry about overfishing. What is France's strategy in this domain?

Regarding illegal fishing, the French strategy relies on three mainlines:

- 1. Monitoring unusual or suspicious behavior through electronic sensors.
- 2. Maximizing the benefits of satellite imagery.
- 3. Deploying air and maritime assets.

As a consequence, foreign fishing vessels know they are being watched, inside and outside the EEZ, and they do not venture to fish illegally in our waters.

In 2020, we continuously monitored 1,677 foreign fishing boats, and Guardian aircraft flew over 304 fishing boats in the EEZ and its surroundings.

FRANCE: AN INDO-PACIFIC NATION

France's strategic priorities in this challenging region are defined in "France's Defence Strategy in the Indo-Pacific," published in 2019:

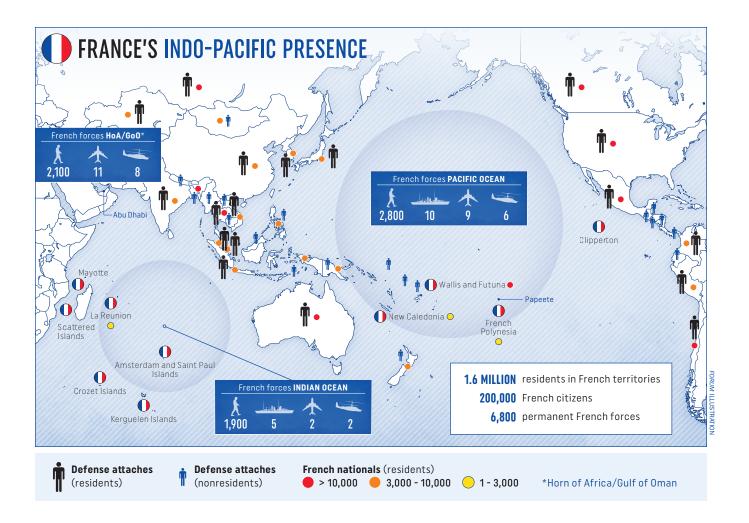
- Defend and ensure the integrity of France's sovereignty, and the protection of our nationals, territories and exclusive economic zone.
- Contribute to the security of regional environments through military and security cooperation.
- Maintain free and open access to the commons, in cooperation with our partners, in a context of global strategic competition and challenging military environments.
- Assist in maintaining strategic stability and balances through comprehensive and multilateral action.

Strong and effective cooperation practices with Pacific island countries are also in place. Examples of such measures include maritime information sharing on a weekly basis, patrols by French ships in other EEZs, deployment of liaison officers onboard Navy vessels and law enforcement training for local authorities.

How does France cooperate with other Indo-Pacific countries?

France maintains bilateral relationships with every country in the area through its important diplomatic network, as well as through regular military cooperation.





Moreover, France is fully integrated into multinational organizations, such as the Western Pacific Naval Symposium, the Joint Heads of Pacific Security meeting, and the Pacific and Indian Ocean Shipping Working Group. France participated in the most recent ASEAN [Association of Southeast Asian Nations] Defense Ministers Meeting-Plus.

Since 2002, France has also been a member of a quadrilateral defense cooperation organization. The group was created in 1992 on the initiative of Australia, New Zealand and the U.S. to provide assistance to island countries to optimize structural cooperation for bilateral military and security cooperation. The organization also strives to strengthen political dialogue between Pacific countries and to keep up with any evolution regarding security.

France takes part in many regional exercises, such as the Rim of the Pacific (RIMPAC). Even with the challenging pandemic context, we have been able to send a French Navy ship to this important exercise, which shows the strong partnership we have with U.S. Pacific Fleet as well as with all the U.S. forces in the Indo-Pacific. But RIMPAC is not the only important exercise. I cannot conclude without mentioning the Marara and Croix du Sud exercises, which are

organized by France, alternating every two years, respectively, in Polynesia and New Caledonia. The Marara exercise in April and May 2021 simulated a humanitarian assistance and disaster relief operation in a Pacific island country and proved an important opportunity to train together and exchange experiences on a realistic scenario.

Any concluding thoughts?

Regularly deploying naval and/or air assets in this wide space contributes to maintaining bilateral and multilateral relations with France's partners. Our two frigates (one based in Tahiti and one in Noumea) are well-known not only in Southeast Asia but also in the Eastern Pacific. France also deploys, as regularly as possible from France to the Pacific region, the Jeanne d'Arc task group (nearly every year since 2013), consisting of a landing helicopter dock and a frigate, as well as its carrier strike group or destroyers.

Last, but not least, I would also highlight France's capabilities to deploy air assets for short terms far from their bases in mainland France. In August 2018, Mission Pegase participants (four Rafale fighters and their support aircraft) visited several partner countries in Asia after attending the Pitch Black exercise in Australia. □





FORUM STAFF

t was the year a deadly contagion spread through a continent before crossing oceans and seas. A year when oil prices sank and pro-democracy protests broke out in Hong Kong as the world again bowed its head in remembrance of students and other demonstrators massacred in the Tiananmen Square uprising.

It was 2014 — a year of fears over an Ebola pandemic, a sputtering global economy and a ruthless People's Republic of China (PRC).

There were less-heralded events that harsh year. Scientists announced the discovery of 139 new species in the Greater Mekong region of Southeast Asia, including a "dementor" wasp with a venomous sting that turns cockroaches into zombies before devouring them alive.

Elsewhere along the mighty Mekong River, construction of the Xayaburi Dam in Laos entered its second year, while hundreds of kilometers downriver, crews prepared to begin work on another hydropower dam, Don Sahong, near Laos' border with Cambodia.

Meanwhile, in Ho Chi Minh City, Vietnam, leaders from Cambodia, Laos, Thailand and the host nation gathered

A fisherman travels along the Mekong River in northeast Thailand near the border with Laos. Massive hydropower dams upstream have been blamed for record low water levels on the world's 12th-longest river. AFP/GETTY IMAGES

for the quadrennial Mekong River Commission (MRC) summit. The commission member states were tasked with charting a course for the river's sustainability. Looming over the summit: A

cascade of megadams built by a powerthirsty PRC over the prior decade — and dozens of other planned hydropower projects, many of them to be funded and

built by China — threatened the river, the region and its people.

Dried-out riverbeds along the Mekong

River stirred outcry from conservationists

October 2019 over

the recently opened

Xayaburi Dam in Laos.

The river is known as

the lifeblood of the region. AFP/GETTY IMAGES

and villagers in

Absent a drastic change of tack, portended an article about the summit in the online magazine The Diplomat, "2014 will surely be remembered as a tragic turning point for Southeast Asia's most important river, and for the slow death of regional fisheries and agriculture."

'MOTHER OF WATERS'

Seven years after the MRC summit and a quarter century since the intergovernmental commission's founding, how flows the future of the Mekong? Will this "Mother of Waters," as it is known in Thai, remain an irreplaceable source of nourishment, a wellspring of life for a region? In the face of challenges man-made and natural, the answer is murky.

The Xayaburi and Don Sahong dams began operating within months of each other as the calendar turned from 2019 to 2020, and the world again found itself grappling with a pandemic, economic panic and political protest. According to the MRC, 11 other mainstream dams are operational along the Mekong River Basin, all of them on the upper Mekong in China, where the river is known as the Lancang. As of mid-2020, the MRC reported, the

IPD FORUM

PRC planned 11 more mainstream dams on the upper Mekong, including one that was under construction. In addition to the Xayaburi and Don Sahong, nine more mainstream dams were planned along the Lower Mekong Basin, including four proposals that were being reviewed as part of the commission's Procedures for Notification, Prior Consultation and Agreement. That process applies to "large-scale irrigation and hydropower development which may cause significant impacts on the environment, water flow and quality of the Mekong mainstream."

The ripple effects of such projects on the world's 12th-longest river already are substantial, according to research published in April 2020 that relied on daily river height gauges and satellite data collected over almost 30 years. Researchers from climate consultant Eyes on Earth and Global Environmental Satellite Applications developed a predictive model to determine how "the cascade of dams built on the Upper Mekong is altering the natural flow of the river."

The U.S. Department of State-supported report, "Monitoring the Quantity of Water Flowing Through the Upper Mekong Basin Under Natural (Unimpeded) Conditions," found that:

- In 2019, the lower Mekong recorded some of its lowest-ever river levels despite an above-average natural flow from the upper Mekong.
- The "severe lack of water in the Lower Mekong
 ... was largely influenced by the restriction of
 water flowing from the Upper Mekong."

The PRC's 11 megadams along the upper Mekong can hold almost 48 billion cubic meters of water combined in their reservoirs. "The dams greatly expand the institutional capacity to regulate the river flow, with corresponding impacts downstream that need to be addressed through holistic solutions," the researchers noted.

For some experts, the Eyes on Earth report cemented growing worries.

"It shines a dramatic light on how much water China's upstream dams have blocked — even as downstream countries suffered through unprecedented drought," Brian Eyler, senior fellow and director of the Southeast Asia program at the Stimson Center think tank, wrote in an April 2020 article for *Foreign Policy* magazine.

"Of the last 10 major droughts in the lower Mekong basin, eight have occurred since China's first dam began construction," Eyler, author of *The Last Days of the Mighty Mekong*, wrote in another article that same month on the think tank's website.

Essentially, as the Stimson article's headline stated, the PRC had "turned off the tap" on the Mekong, depriving riparian nations downstream of the most precious of resources — and leaving sovereign states at risk of being left high and dry.

TEEMING WITH LIFE

The Mekong is the lifeblood of the region. Trickling into existence in the Tibetan plateau, "the roof of the world,"

the river stretches more than 4,300 kilometers through the PRC, Burma, Thailand, Laos, Cambodia and Vietnam before emptying into the South China Sea. Along its journey, the Mekong drains an area larger than Thailand and Laos combined, while replenishing the fish and crops that have sustained the region's people for millennia.

The largest inland fishery on the planet, the Mekong produces 25% of the world's freshwater catch and is home to more than 1,000 species, from the endangered Irrawaddy dolphin to giant catfish weighing as much as a grizzly bear. The Greater Mekong region, dubbed Asia's "rice bowl," provides livelihoods and sustenance for about 80% of its 300 million inhabitants, according to the World Wildlife Fund (WWF). It brims with biodiversity; from 1997 to 2014, researchers discovered about three new species on average every week.

With unprecedented infrastructure development, including hydropower projects, much is at stake for the magical Mekong, "one of the most vulnerable places on Earth," the WWF reported.

A 2010 report prepared for the MRC by the International Centre for Environmental Management found that the 80 or so dams then planned along the Mekong and its tributaries, including mainstream hydropower projects, could devastate the region's fisheries by 2030. Fish production in the river basin could plummet by more than 40% from 2000 levels, threatening the nutrition and jobs of millions of people and increasing the risk of food insecurity.

The Mekong Agreement, which established the MRC in April 1995, calls on the four founding member states to cooperate "in a constructive and mutually beneficial manner in the sustainable development, utilization, conservation and management of the Mekong River Basin water and related resources."

Cooperative efforts to protect the Mekong had begun four decades earlier when researchers were still exploring the "untamed" river from the backs of elephants "and there were signs of interest to capitalize on its economic potential," according to the commission. The United Nations-endorsed Mekong Committee was formed with "responsibilities for financing, management and maintenance of water resources." Eventually, the committee morphed into the commission.

In its first quarter century, the MRC established a slate of networks to gauge and nurture the Mekong's health, from drought monitoring and flood forecasting to sediment collection and fisheries management guidance. The commission also points to its consultative process as bolstering collaboration and planning among member states and regional players to mitigate ecological and environmental damage from hydropower projects.

Additionally, in 2019, the MRC reached "a new level of cooperation" with its upper Mekong dialogue partners, the PRC and Burma, the commission's chief executive officer, An Pich Hatda, wrote in the organization's 2019 annual report.

Particularly in light of the Eyes on Earth study, the Stimson Center's Eyler is among those who view the MRC as vital in addressing inequities in water resource distribution in the lower Mekong caused by the PRC's upriver dams.

"Working through the Mekong River Commission ... to achieve these ends is a best path forward," he wrote.

WEAPONIZING WATER

How far is the PRC's authoritarian regime willing to go in addressing — let alone ensuring — water access? It's a question with potentially life-ordeath consequences for lower Mekong states. The Chinese megadams are, after all, an undeniable reality — concrete behemoths set to cast their shadow over the river for decades, if not centuries.

"While the presence of China's dams cannot be altered, China can and should change the way it operates these dams," Eyler wrote.

Observers, however, say the PRC uses its hydropower projects not just to store water and generate electricity for its 1.4 billion people but also as a bargaining chip to expand regional influence for its own ends. It has, in effect, weaponized water.

"While much attention has been given to the nation's fearsome new military hardware, a formidable component in its arsenal has largely escaped notice: dams," Eugene K. Chow wrote in an August 2017 article in *The National Interest* magazine.

Annually, water flowing from the PRC accounts for an estimated 16% of the Mekong's total flow, although that can leap as high as 70% during droughts.

"By controlling the flow of the lifeblood of the region, China has gained enormous power, which has led to accusations of abuse," Chow wrote.

The MRC's response to the prospect of China waging water war has not always been viewed as full-throated. Rather, at times, the commission has seemed like a man tiptoeing around his own home so as not to draw the ire of a capricious giant living upstairs.

Case in point: its lukewarm response to the Eyes on Earth study.

In an April 2020 commentary note, the commission said the researchers had not adequately "taken into account the complexities of rainfall and runoff" and that their findings "do not align with the MRC's observations on the ground."

Citing "uncertainty" in the study's use of satellite data, the commission said its own initial analysis "showed that the 2019 drought in the basin was due largely to insufficient rainfall

DAMMING THE 'MOTHER OF WATERS'

Thirty-three hydropower projects were operating or planned along the mainstream Mekong River as of mid-2020, including 22 in China.



during the wet season with a delayed arrival and earlier departure of monsoon rains and an El Nino event that created an abnormally higher temperature and higher evapotranspiration."

While acknowledging that the PRC's dams have altered water flows where the river enters the lower Mekong basin, the commission said that situation "brings both opportunities and challenges."

It suggested more cooperation with the PRC was needed.

"To increase the transparency of dam operations and to demonstrate cooperation in good faith, China should consider providing more data," the MRC concluded.

Like the commission, the PRC pointed the finger of blame at the skies. Though also "afflicted" by precipitation shortages, the PRC had "overcome various difficulties to increase the water discharge of the Lancang River and help Mekong countries alleviate the impact of the drought," Foreign Minister Wang Yi claimed in February 2020.

"China will also consider sharing with the Mekong

countries hydrological information for the whole year," Wang said, according to a PRC Ministry of Foreign Affairs statement.

For many, this seemed to be another of the PRC's empty promises.

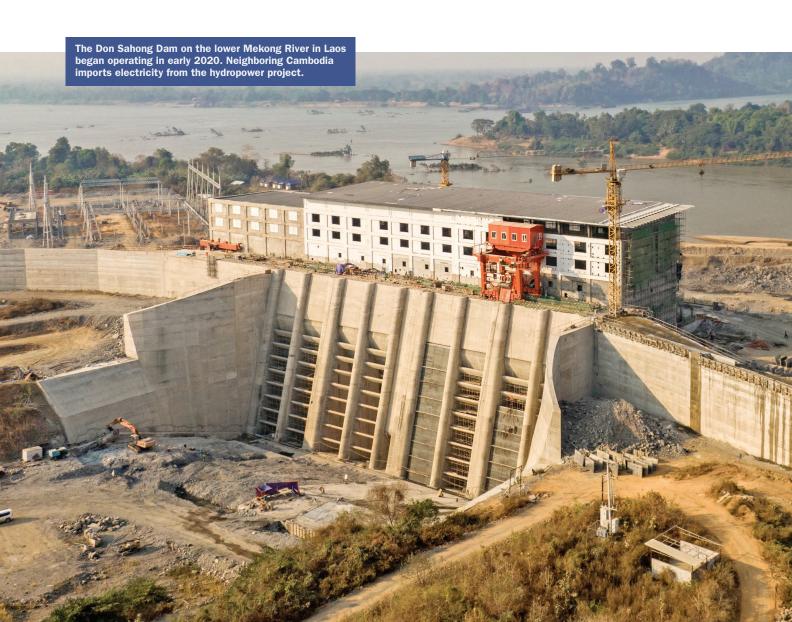
NAVIGATING THE FUTURE

The MRC's calibrated response to the study may reflect a wider political reality highlighted by observers of the region: China's money and might have muffled complaints.

Total Chinese investments and construction projects in Burma, Cambodia, Laos, Thailand and Vietnam surpassed U.S. \$75 billion from 2010 to 2019, the Center for Strategic and International Studies, a U.S.-based think tank, reported in April 2020.

In the energy sector, the PRC was involved in the development of 18% of existing, planned or under construction projects in the Mekong region as of 2020, the Stimson Center reported.

"With control of the Tibetan plateau by dint of its



geography, China is king of the hill when it comes to water in Asia and there is little downstream nations can do to change the whims of this monarch," Chow wrote in *The National Interest*.

Other factors have hamstrung efforts to counter the PRC's ability to choke the river's flow downstream. In refusing to become a commission member, the PRC "effectively crippled" the organization, noted a June 2018 commentary published by the Royal United Services Institute, a United Kingdom-based defense and security think tank.

Further, border disagreements and ethnic frictions "continue to dog relations between the lower riparian states, often spilling over into the regional arena and complicating efforts to cooperate over the Mekong," wrote commentator Brijesh Khemlani, a Bangkokbased analyst in Southeast Asian issues.

He called for fortifying multilateral entities, including the MRC and the U.S.-led Lower Mekong Initiative (LMI), as a bulwark against the PRC and to seed sustainable development.

"Chinese expansionism in the Mekong must be countered," Khemlani warned, "for leaving matters as they are will be a recipe for disaster."

The LMI, a partnership among Burma, Cambodia, Laos, Thailand, Vietnam and the U.S., marked its 10th anniversary in 2019. Its goal is to "deliver equitable, sustainable and inclusive economic growth" for the five Mekong partner nations structured around six pillars: environment and water, health, agriculture, connectivity, education, and energy security.

The initiative is supported by the Friends of the Lower Mekong, a consortium that includes Australia, the European Union, Japan, New Zealand, South Korea, the Asian Development Bank and the World Bank.

At an August 2019 event celebrating the LMI's first decade, then-U.S. Secretary of State Mike Pompeo noted the partnership's achievements but also highlighted "troubling trends."

"We see a spree of upstream dam building which concentrates control over downstream flows," he told ministers from the LMI nations. "The river has been at its lowest levels in a decade — a problem linked to China's decision to shut off water upstream. China also has plans to blast and dredge riverbeds. ... And we see a push to craft new Beijing-directed rules to govern the river, thereby weakening the Mekong River Commission."

Pompeo announced a raft of new projects designed to protect the river and region, including:

- The Japan-U.S. Mekong Power Partnership (JUMPP) to develop sustainable regional electricity grids and quality infrastructure, with initial U.S. funding of U.S. \$29.5 million.
- U.S. \$14 million in funding for Mekong nations to fight transnational crime and trafficking, including stemming the methamphetamine

- trade in the Golden Triangle region encompassing parts of Burma, Laos and Thailand.
- A South Korea-U.S. project to better use satellite imagery to evaluate flood and drought patterns along the Mekong.
- An LMI water data-sharing platform and public impact program.
- An Indo-Pacific conference to strengthen governance of transboundary rivers, including "a transparent, rules-based approach to the Mekong."

"We will continue to help protect your sovereignty and security, help you prosper economically, and safeguard your rich cultures and environment," Pompeo said.

SURGING DEMAND

Prosperity begets development and an accompanying hunger for energy, fueling the drive to tap into renewable sources, such as hydropower. Humans have used water to generate power for thousands of years — today, hydropower accounts for about 70% of the renewable electricity produced worldwide, according to the National Geographic Society.

In unveiling the JUMPP project, the LMI noted that electricity demand in the Mekong nations is projected to rise about 6% annually. The U.S.-Japan effort will support "the unfettered flow of energy supplies in the Indo-Pacific region which is vital to the stability and development of the region."

In March 2020, as the world fixated on the coronavirus scourge, there was some good news for the Mekong River: Cambodia announced a 10-year moratorium on mainstream dam development, shelving plans for its first two hydropower projects. Two months earlier, the nation's grid had started importing power from the new Don Sahong Dam under a 30-year energy agreement with neighboring Laos.

Still, the new dams rise along the Mekong's mainstream and tributaries, with more than 370 planned, *The Washington Post* newspaper reported in January 2020. Many of them are to be built by Chinese companies as part of the PRC's One Belt, One Road scheme.

This, even as the MRC's annual report in June 2020 warned of risks from development and reported that "severe droughts in the Lower Mekong Basin have caused substantial economic losses due to damages of agricultural crops, negative impacts on the environment, and adverse effects on people's livelihoods."

This, even as the PRC holds back water that could quench a region's thirst.

In April 2022, leaders of the MRC's four member states will gather in Laos for the commission's next quadrennial summit. The overriding question then, as now, will surely be: How flows the future of the mighty Mekong? □



Breaking the PRC's CHOKEHOLD

India looks to new partners, maturing defense agreements to counter Chinese aggression

SAROSH BANA

here is a method to the People's Republic of China's (PRC's) vigorous outreach seeking to buy influence with India's immediate neighbors Bangladesh, Burma, Maldives, Nepal, Pakistan and Sri Lanka, and by menacing India's closest ally, Bhutan.

The PRC also seems to have correctly calculated that India, despite its military prowess, would show tremendous restraint in the face of the People's Liberation Army's (PLA's) brazen effort in mid-2020 to overrun almost 1,000 square kilometers of eastern Ladakh in the western sector of the Line of Actual Control (LAC) that divides the two powers.

The PRC deployed an estimated 60,000 troops in the incursion, which along with being emblematic of its aggression toward India, represents the most serious phase of tensions between the two countries since their monthlong war in 1962 in the same region. In the aftermath of that conflict, the PRC seized Aksai Chin, a 38,000-square-kilometer, high-altitude desert almost the size of Bhutan that is claimed by India as part of its Union Territory of Ladakh. The PRC additionally claims the 83,743 square kilometers of the northeast Indian state of Arunachal Pradesh that lies along the eastern sector of the LAC. The two nations have long disputed the length and position of the LAC, which is divided into three sectors. Indeed, Chinese workers backed by PLA troops subsequently crossed

into Arunachal to construct a village along the border separating the state from Tibet, on the banks of the Tsari Chu river in the Upper Subansiri district. India's Ministry of External Affairs acknowledged the move and said it was aware of the construction "along the LAC," which is generally viewed as the PRC's attempt to buttress its claims to the region as part of its strategy to build civilian settlements in disputed frontier areas. Beijing itself rebuffed all criticism, maintaining that this encroachment was "beyond reproach" because it had "never recognized" Arunachal.

Even as the impasse in eastern Ladakh simmered on, the PRC struck again, this time in Sikkim, India's tiny northern state that is separated from Arunachal by Bhutan. Chinese troops clashed with Indian Soldiers on the LAC at Naku La in Sikkim on January 20, 2021, an incident described by the Indian Army as a "minor face-off." The last such incident had occurred in the same area in May 2020.

As 2020 came to a close, India was hoping that the PRC would maintain at least a status quo in Eastern Ladakh. Its overworked Soldiers were hunkering down in this desolate, rarefied border region that averages 3,000 meters above sea level. Temperatures there during the harsh winter can plummet below minus 45 degrees Celsius, testing the limits of mental and physical endurance.

New Delhi was thus relieved that the ninth round of military-level talks between the two sides in February 2021 produced an agreement on disengaging from the north and south banks of Pangong Lake in eastern Ladakh. Defence Minister Rajnath Singh informed India's Parliament on February 11 that "to ensure disengagement in friction points along the LAC, it was our view that troops of both sides who are now in close proximity should vacate the forward deployments made in 2020 and return to the permanent and accepted bases."

While the disengagement was progressing satisfactorily at Pangong Lake, the standoffs in other areas such as Depsang Plains, Gogra Heights and Hot Springs were taking time to resolve.

What has proved heartening is that both sides have now agreed to maintain the momentum of dialogue and negotiation and to continue their efforts to ensure the restraint of the front-line troops, stabilize and control the situation along the LAC in the western sector of the China-India border, and jointly maintain peace.

To help contain PRC aggression without inflaming war, India may look to strengthen its emerging relationships such as the Quadrilateral Security Dialogue, or Quad, with Australia, Japan and the United States. Maturing defense agreements among the countries and others in the region may also advance India's security efforts.

Beijing took advantage of the COVID-19 pandemic,

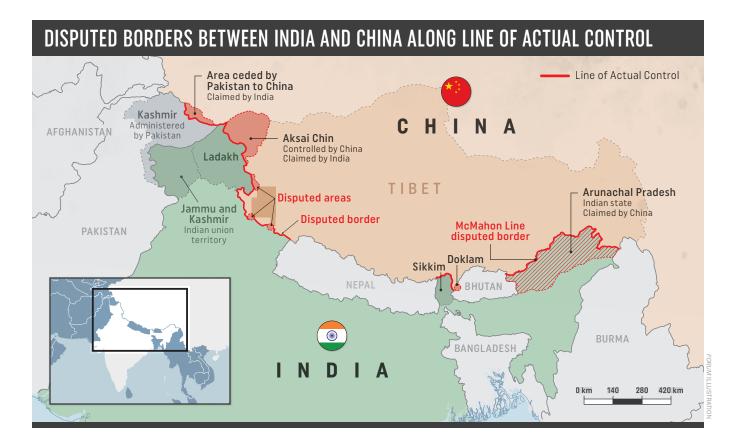
which strained India economically and politically, and distracted its military. Meanwhile, the PRC was scarcely fazed by the global reproach it aroused for its handling of the calamitous outbreak, widely believed to have originated in Wuhan, China. The PRC was intent on riding its foreign policy agenda on the back of its economic and military vitality.

BORDER TENSIONS

Ever since the PRC invaded Tibet in 1950 and annexed it the following year, extending itself to India's frontier, the PRC has loomed menacingly over the world's second-most populous nation. Despite three agreements, in 1993, 1996 and 2013, for maintaining peace and stability on the LAC, Beijing has consistently disputed the demarcations, and since the 1980s has gradually captured a cumulative 640 square kilometers of land through multiple inroads into Ladakh before its emphatic push into eastern Ladakh in 2020.

The PRC's close ally Pakistan also has border disputes with India. The neighbors have gone to war four times, at the time of their Partition in 1947, and in 1965, 1971 and 1999. The war of 1971 also engendered Bangladesh from the fall of East Pakistan.

India shares borders of 4,097 kilometers with Bangladesh; 3,323 kilometers with Pakistan; 1,751 kilometers with Nepal; 1,643 kilometers with Burma; 699 kilometers with Bhutan; and 106 kilometers with Afghanistan.





Indian External Affairs Minister Subrahmanyam Jaishankar, right, and Japanese Foreign Minister Toshimitsu Motegi participate in a Quadrilateral Security Dialogue meeting in Tokyo in October 2020. REUTERS

The PRC is purposefully extending its sphere of influence by developing a chain of ports across Bangladesh, Burma, Maldives, Pakistan and Sri Lanka, essentially garroting India within a ring of volatility. Foreign military experts have dubbed the plan the "string of pearls" strategy. The PRC has built Gwadar Port in Baluchistan, Pakistan, that links to Kashgar in China's far western Xinjiang region via the U.S. \$46 billion China-Pakistan Economic Corridor (CPEC) that both partners hail as the "great monument of Pakistan-China friendship."

PREDATORY LENDING

The CPEC serves as a flagship for the PRC's One Belt, One Road (OBOR) scheme, which is a U.S. \$1 trillion sequence of infrastructure projects spanning 70 countries. Beijing has disbursed predatory loans for financially unsustainable projects as part of OBOR, only to assume control over the infrastructure it initiates as compensation for defaults on repayments.

Though Beijing insists OBOR is a commercial initiative, naval basing appears to be a key part of the PRC's unspoken agenda. Gwadar will grant the PRC a maritime gateway to the Arabian Sea on India's western seaboard and to the Indian Ocean, Persian Gulf and the gulfs of Oman and Aden. India opposes the CPEC because the project runs through Gilgit-Baltistan and Pakistan-occupied Kashmir, control of which India also disputes. Under the agreement, Pakistan is obliged to pay U.S. \$40 billion to China over 20 years through debt repayments and dividends.

Beijing also enhances its OBOR enticements with military provisioning. In 2017, Islamabad announced the purchase from China of four modified Type 041 Yuan-class attack submarines and technology transfer for the assembly of four more in the port city of Karachi, in a deal estimated at U.S. \$5 billion. The first four submarines are to be delivered by 2023 and

the remainder by 2028 to form the core of Pakistan's offshore nuclear second-strike triad. Also in 2017, Bangladesh purchased two Chinese-made Type 035G Ming-class submarines worth U.S. \$204 million.

DUAL USES

Chinese-built tanks, frigates and fighter jets also equip Bangladesh's military, and its military personnel are regularly trained in the PRC. The two countries forged a strategic partnership, and Bangladesh formally joined OBOR during Chinese Communist Party General Secretary Xi Jinping's visit to Dhaka in 2016.

Work has since been progressing on nine projects worth U.S. \$7.1 billion, part of 27 China-funded infrastructure projects in Bangladesh under OBOR. Beijing also declared a zero-duty policy for 97% of Bangladeshi imports. The PRC has promised about U.S. \$30 billion in financial assistance to Bangladesh, overshadowing India's development aid contributions of U.S. \$10 billion.

Bangladesh also concluded a U.S. \$1 billion agreement with the PRC on water management after failing to secure a water-sharing pact with India over Teesta, the country's fourth-longest river, which flows from India. The PRC is Bangladesh's largest trading partner, with trade worth U.S. \$18 billion. India's trade with Bangladesh hovers around U.S. \$9.5 billion.

Although a deal fell through in 2014 for the PRC to build a port in Sonadia, Bangladesh, the PRC found an alternative site in Burma to heighten its presence in the Bay of Bengal on India's eastern seaboard. During his January 2020 visit to Burma, Xi finalized a deal for the Kyaukpyu Special Economic Zone Deep-Sea Port Project, to cost U.S. \$1.3 billion in the first phase.

The port in the western state of Rakhine, which borders Bangladesh to the north, will abut the Bay of Bengal. Across the bay, India is developing a nuclear submarine base called Project Varsha near its Eastern Naval Command at Visakhapatnam. Kyaukpyu could double as a military facility should conflict arise. The project's initial cost of U.S. \$7 billion was slashed upon Burma's fears of a debt trap. Other key PRC-aided infrastructure projects underway are New Yangon City and the China-Burma Border Economic Cooperation Zone. China is suspected of maintaining a naval intelligence unit at a base in the Coco Islands, near India's outlying island territories of Andaman and Nicobar.

When Sri Lanka struggled in 2017 to make payments on its more than U.S. \$1.1 billion deal with the PRC to develop its southern seaport of Hambantota, Beijing gained control of the strategic port through a 99-year lease. The PRC may use the port, and prospectively Gwadar as well, as a PLA Navy base to bolster its profile in the littoral.

The PRC is also expanding from Hambantota to the Colombo port, the deepest container terminal in South Asia. In the single largest foreign direct investment into

Sri Lanka, China Harbour Engineering Co., part of the state-owned China Communications Construction Co., is creating the U.S. \$1.4 billion Colombo International Financial City on 660 acres reclaimed from the sea. This "city-within-the-city" is expected to be a major financial hub to rival Singapore and Dubai and boost the economy and maritime trade of the island country. China is also investing U.S. \$1 billion in constructing three 60-story buildings at the site.

In regard to the island territory of the Maldives, India fears that the potential expansion — from 38,000 to 100,000 square meters — of the island of Feydhoo Finolhu, which a Chinese company acquired in 2016 on a 50-year lease for U.S. \$4 million, could lead to the establishment of a Chinese military base, possibly for nuclear submarines, and a listening post to track Indian naval movements in this strategic part of the Indian Ocean. The Maldives lies just 623 kilometers from Kanyakumari, the southernmost tip of India. The PRC has similarly created, and militarized, artificial features in the South China Sea — seven in the Spratly Islands and 20 in the Paracel Islands — for what it declares its "natural right as a sovereign nation." It has also saddled the Maldives with a debt burden of U.S. \$1.5 billion. when this island nation's annual revenue is about U.S. \$1.7 billion and its gross domestic product is U.S. \$4 billion.

'PACKAGE SOLUTION'

The PRC has penetrated into Bhutan in recent years, culminating with the PLA's intrusion into the landlocked Buddhist kingdom in November 2020 to construct what satellite images showed to be a linear residential complex along the Doklam plateau. The plateau, which lies at the disputed trijunction border that the two countries share with India, was the site of a tense 73-day China-India standoff in 2017. Subsequent imagery showed ammunition depots had been built alongside the new settlement.

Prior to the intrusion, China had announced a "package solution" to its boundary dispute with Bhutan that harkened back to its 1996 proposal for ceding to Bhutan disputed areas to its north in exchange for disputed western areas, including Doklam, and Bhutan's eastern boundary straddling the Sakteng forest sanctuary. Bhutan is India's staunchest ally in the region, but the India-Bhutan Friendship Treaties of 1949 and 2007 have no explicit defense clause.

Doklam is key to the PRC's hegemony in the region as are Tibet's Chumbi Valley, north of Doklam, and India's Siliguri Corridor, to the south, both strategic mountain chokepoints. With a bold advance, the PRC could cut off the 60-kilometer-long corridor, also known as "Chicken's Neck," a 22-kilometer-wide swath that connects mainland India to its eight far-flung northeastern states that are bordered by Bangladesh, Bhutan, Burma and China's Tibet Autonomous Region.

PRC COUNTERMOVES

In recognition of the PRC's influence strategy, India has stepped up its goodwill visits, sending three top officials to neighboring countries in November 2020. External Affairs Minister Subrahmanyam Jaishankar went to Seychelles after visits to Bahrain and the United Arab Emirates. National Security Advisor Ajit Doval called on the Sri Lankan leadership, and Foreign Secretary Harsh Shringla visited Nepal, following trips to Bangladesh and the Maldives.



India is building a highway that passes by the confluence of the Indus and Zanskar rivers in its Ladakh region. REUTERS

Time may not be on India's side, but it must continue to counter the PRC's attempts to buy influence with its neighbors. In addition to offering neighbors economic and military alternatives to the PRC's OBOR enticements, India should look to the Quad, a growing chorus of analysts contend. Together, the Quad nations could create an infrastructure fund that provides financially sustainable alternatives to the PRC's debtladen projects for India's neighbors.

Moreover, the Quad could strengthen maritime domain awareness, project power by sharing logistics and develop defense technologies to counter the PRC in the region. Maturing defense agreements will help shore up the Quad's capabilities. In October 2020, for example, India and the U.S. signed a pact to share sensitive satellite data, typically used for guiding missiles and drones. The agreement was the latest in a series of India-U.S. pacts to counter the PRC's growing expansionism in the Indo-Pacific region.

A strong Quad, with its economic and military interdependence, will, at minimum, force the PRC to think twice about its continuing aggression in the Indian Ocean region and encroachment on the borders of India and its neighbors. \square



SOUTHEAST ASIA OFFERS NEW OPPORTUNITIES FOR MARITIME SECURITY PARTNERSHIPS

CMDR. (RET.) JOHN F. BRADFORD/U.S. NAVY



apan's maritime strategy is fundamentally focused on partnering with its ally the United States to ensure that the Indo-Pacific sea lanes critical to its security are safe and secure. Most of the activities by its two maritime security services, the Japan Maritime Self-Defense Force (JMSDF) and Japan Coast Guard (JCG), are focused on Japan's near seas and seek to deter aggressive actions by the People's Republic of China (PRC), North Korea and Russia while enabling good governance of the Japanese exclusive economic zone. Japan also deploys its forces to locations along those sea lanes, such as the Gulf of Aden and Strait of Hormuz, where Japanese shipping is under significant and direct threat. Equally critical to the strategy are the Japanese activities aimed at the relatively more safe and secure, yet still vulnerable sea lanes that pass through and near Southeast Asia. This includes enclosed seas, such as the South China Sea, Java Sea and Bay of Bengal, as well as

critical chokepoints, such as the Lombok, Malacca, Singapore and Sunda straits.

Much of this effort draws on Japan's economic strength, and Japan has been heavily invested in developing infrastructure and safety capacity alongside the region's coastal states for more than 50 years. For the past 20 years, the JCG has also been engaged with developing the coastal states' maritime law enforcement capacity. In the past decade, the Japanese Ministry of Defense has become involved by starting new capacity-building projects with regional navies, and the JMSDF has been increasingly conducting military operations in the regional waters.

With all branches of Japan state power now investing in Southeast Asian maritime security, this region is cementing itself as a new nexus in Japan's maritime strategy. The scope, strategic intent and likely future development of Japan's maritime security activities in Southeast Asia merit closer examination.



JAPAN'S MARITIME STRATEGY

Japan's well-established maritime security strategy can be broadly separated into two geographic segments, one pertaining to Japan's home waters and the other to Indo-Pacific sea lanes. In its near seas, Japan faces significant security pressures from the north, west and south. Aggressive contemporary military postures, territorial disputes and war legacy issues create security concerns and constrain cooperation between Japan and its neighbors Russia, the PRC and the Koreas.

In the maritime space, the competition with the PRC is the most strained. The concentric rings of Japanese and PRC coast guards and naval forces persistently contest sovereignty, probe reactions and seek to assert control over the waters surrounding the Senkaku Islands. This situation demands significant fleet resources while the remainder of the East China Sea provides a long front for patrol and surveillance. The ballistic missile threat from North Korea and Japan's support for the enforcement of United Nations Security Council sanctions against that state also keep the fleet busy. Above the waters approaching Japan, the Japan Air Self-Defense Force regularly scrambles fighters in response to PRC and Russian flight operations. Given this increasingly severe situation, protecting Japan's rights and executing its national responsibilities in the sea and airspace under the U.N. Convention on the Law of the Sea have occupied the bulk of Japan's security resources.

Japan's strategy to ensure the safety and security of its critical sea lanes rests on three elements: leveraging its alliance with the U.S., deploying forces to most critical threat locations and strengthening relations with increasingly capable partners along the sea routes.

In recent years, Japanese maritime strategy has nested under national campaigns to focus Japan's foreign policy in the Indo-Pacific band that stretches along its sea lanes to Europe and Africa. Shortly after former Prime Minister Shinzo Abe assumed office for the first time in 2006, then-Foreign Minister Taro Aso announced the Arc of Freedom and Prosperity. This foreign policy complemented Japan's existing priorities involving managing relations with immediate neighbors and strengthening the U.S. alliance, with an additional emphasis on promoting democracy and increased capability with an arc of partner nations stretching from Northern Europe, through the Middle East, past the Indian subcontinent and across Southeast Asia. Notably, this arc aligned geographically with Japan's main trade routes, minus those across the Pacific Ocean that were already secure, thanks to the U.S. alliance. Abe became the first global leader to highlight the Indo-Pacific geopolitical concept when he gave a 2007 address to the Indian Parliament titled "Confluence of the Two Seas." The next two prime ministers, both from the Liberal Democratic Party, continued with this prioritization. When the Democratic Party of Japan led the government from 2009-12, Prime Ministers Yukio Hatoyama, Naoto

Kan and Yoshihiko Noda used different branding but sustained this foreign policy approach toward the coastal states of South and Southeast Asia. Immediately after returning to power in 2012, Abe published an essay titled "Asia's Democratic Security Diamond." It opened with: "Peace, stability and freedom of navigation in the Pacific Ocean are inseparable from peace, stability and freedom of navigation in the Indian Ocean. Japan, as one of the oldest sea-faring democracies in Asia, should play a greater role — alongside Australia, India and the U.S. — in preserving the common good in both regions."

Southeast Asia was clearly at the heart of the diamond, and it is now the nexus of the Free and Open Indo-Pacific vision announced in 2016.

JAPANESE CIVIL ACTIVITIES TO STRENGTHEN SOUTHEAST ASIAN MARITIME SAFETY AND SECURITY

The sea lanes between Japan's home waters and the dangerous sea space around the Middle East stretch for more than 5,000 nautical miles (9,260 kilometers). For the most part, these sea lanes pass by coastal states capable of providing the governance needed to ensure safety for the free flow of commerce. However, the coastal states vary widely in terms of maritime capacity, the sea lanes are far from hazard-free, and Japanese business and government leaders worry that disruptive events could quickly create a crisis. The hazards that concern Japan include the navigation challenges associated with heavily traveled chokepoints, environmental challenges, such as extreme weather and oil spills, piracy, terrorism and war risks. For the past five decades, Japan has become increasingly involved in addressing these challenges by supporting coastal state capacity-building projects as a core element of its maritime security strategy.

The rise of regional piracy rates in the wake of the 1997 Asian monetary crisis catalyzed an expansion of Japan's capacity-building efforts to include maritime law enforcement. Prime Minister Keizo Obuchi kick-started this expansion at the Association of Southeast Asian Nations Plus Three (ASEAN+3) summit in December 1999, when he sought international cooperative action against piracy by proposing the establishment of a regional coast guard body, the strengthening of state support for shipping companies and improvement of regional coordination.

Soon, Japan was offering equipment and training and pressing for combined patrols. After a series of Japanese fact-finding delegations visited the region and Tokyo hosted several large conferences, Japan's ambitions were scaled back, but the expanded involvement in Southeast Asian maritime law enforcement nonetheless came quickly. In 2000, the JCG began establishing permanent overseas positions for officers to support regional coast guards (starting with the nascent Philippine Coast Guard), and in 2001, the JCG began exercising with regional coast guards (starting with the Philippines and Thailand). In 2006, Japanese diplomatic efforts



culminated in the creation of the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP).

A notable aspect of Japan's support for Southeast Asia's maritime security has been the transfer of patrol boats to regional maritime law enforcement agencies. These have included converted fishing vessels, retired Japanese patrol boats and new vessels. They have been provided by private Japanese foundations, through governmentfacilitated loans, and as direct assistance. Early examples are the transfers to Indonesia and the Philippines in the mid-2000s. As these vessels were armored, the transfers were governed by Japan's Three Principles on Arms Exports and the receiving partners could only use them for law enforcement operations, to include anti-piracy and counterterrorism. Relaxation of the Three Principles in 2011 and 2014 has streamlined the policy process, and in recent years, Japan has expanded its programs to provide patrol vessels. To date, coast guard and maritime law enforcement agencies in Cambodia, Indonesia, Malaysia, Palau, the Philippines, Sri Lanka and Vietnam have received patrol vessels from Japan.

JAPAN SELF-DEFENSE FORCES OPERATIONS IN SOUTHEAST ASIA

The earliest JMSDF ship deployments aimed specifically at impacting the Southeast Asian maritime security

situation aligned with multilateral efforts and frameworks. In December 2004, Japan Self-Defense Forces (JSDF) ships and aircraft were among the international forces that responded to the Indian Ocean tsunami. In 2005, the JMSDF participated in the inaugural Western Pacific Naval Symposium (WPNS) at-sea exercise hosted by the Republic of Singapore Navy, and Japan Ground Self-Defense Force officers participated in the tsunami relief workshop and high-level staff portions of the Thai-U.S. military exercise Cobra Gold. Since then, maritime exercises sponsored by multilateral organizations such as WPNS, the ASEAN Regional Forum and the ASEAN Defence Ministers Meeting-Plus (ADMM+) have become more frequent, and the JMSDF has consistently participated, often sending the largest contingents. While significant from a defense diplomacy perspective, these multinational maritime exercises were often quite simple and aimed more at confidence-building than strengthening operational capacity. Many of them focused on disaster response rather than more traditional security concerns.

Japan's National Defense Program Guidelines of 2010 became the first major policy to state that the JSDF would begin conducting capacity-building missions with foreign militaries. The first operation under this policy was the 2010 deployment of a JMSDF ship to conduct capacity-building activities in Cambodia and Vietnam as part of the U.S. Pacific Partnership campaign. Since then,

JMSDF ships have participated in Pacific Partnership annually, only missing 2011 when they were supporting domestic disaster-response operations in the wake of an earthquake and tsunami. In 2012, Japan executed its first bilateral capacity-building activity in Southeast Asia, an underwater medicine seminar held with the Vietnam Navy. The second bilateral event was a February 2013 oceanography-focused seminar at the Indonesian Navy Maritime Operations Center in Jakarta. Since then, Japan has conducted similar bilateral capacity-building activities with eight other partner nations. Of these 10 partners, all but Mongolia are South China Sea or Bay of Bengal coastal states.

In December 2013, Japan's first National Security Strategy explained the strategic intent behind these activities: "Japan will provide assistance to those coastal states alongside the sea lanes of communication and other states in enhancing their maritime law enforcement capabilities and strengthen cooperation with partners on the sea lanes who share strategic interests with Japan."

In the past decade, the JMSDF has also expanded operations in the South China Sea. Unlike the multilateral exercises and capacity-building activities

previously mentioned, these activities appear to be more focused on developing options to conduct high-end naval operations around that body of water. Since Japan does not publicize the locations of its ships and submarines, it is unclear when these deployments began.

Some analysts, including retired Japanese admirals, argue that the JMSDF is also readying to counter a potential PRC ballistic missile submarine bastion in the South China Sea. Such a concern would help explain the JMSDF's emphasis on its partnerships with the Philippines and Vietnam, the nations that straddle the sea's northern section and flank the important PRC submarine base on Hainan island.

The JMSDF's relationship with the Philippine Navy is the most developed of its Southeast Asia partnerships. JMSDF officers began observing the annual Philippines-U.S. Balikatan exercise in 2012 and involvement later increased. In 2016, Japan's training submarine Oyashio visited Subic Bay in the Philippines alongside two JMSDF destroyers, and the crews took part in confidence-building activities with Philippine counterparts. This was the first JMSDF submarine port call to the Philippines in 15 years. Since then,



JMSDF submarines have been frequent visitors to Subic Bay.

The Philippines is also the first and, thus far, only nation to acquire Japanese defense equipment. Policy reforms in 2014 allowed Tokyo to approve defense exports to partner militaries, and in 2017, two used JMSDF TC-90 training aircraft were delivered to the Armed Forces of the Philippines, where they were designated as C-90 maritime patrol aircraft. Three additional TC-90s were transferred in 2018.

Japan has also prioritized development of its defense relations with Vietnam. The first JMSDF capacity-building activity in the region was during the 2010 dispatch of the amphibious transport dock ship JS Kunisaki to Qui Nhon, Vietnam, under the Pacific Partnership umbrella. While focused on medical treatment activities and cultural exchanges, the visit included the use of amphibious vehicles landing on a Vietnamese beach. The next year, Vietnam hosted the first JSDF capacity-building activities in Southeast Asia not facilitated as part of a U.S. or multilateral event. Since then, the relationship has grown, though it has not yet reached a level that includes bilateral defense exercises or operations.

Annual deployments of large helicopter carriers, such as the JS Izumo for a multimonth deployment to Southeast Asia and the Indian Ocean, encapsulate the varied nature of JMSDF activities in the region. In 2016, during the first of these deployments, the JS Ise was the largest ship at the multinational exercise Komodo hosted by Indonesia. The ship then transited to the South China Sea with a cadre of midshipmen from WPNS navies for training while conducting a trilateral passing exercise with Royal Australian Navy and U.S. Navy ships. After a goodwill visit to Manila, the JS Ise was the largest ship involved in the May 2016 ADMM+ Maritime Security/Counter-Terrorism Field Training Exercise that began in Brunei and concluded in Singapore. The following year, the JS Izumo, the JMSDF's largest ship, made a similar deployment to Southeast Asia that included: a maritime security training program for officers from ASEAN navies while the ships were in the South China Sea; hosting Philippine President Rodrigo Duterte during a port visit to Manila; calling in Sri Lanka; and completing two days of exercises with ships from Australia, Canada and the U.S. that included cross-deck exchanges and live-fire events. Similar deployments in 2018 (JS Kaga) and 2019 (JS Izumo) blended unilateral operations in the South China Sea, exercises with the U.S. and other navies, support for multilateral maritime security programs and bilateral relationship-building with regional partners.

FUTURE TRAJECTORIES FOR JAPAN'S INVOLVEMENT IN SOUTHEAST ASIAN MARITIME SECURITY

The blended nature of the JMSDF capital ship deployments to Southeast Asian waters reflects its

multifaceted maritime goals in the region. Japan is expanding on decades of capacity-building initiatives in the region to include military dimensions. These activities are aimed at strengthening relationships with increasingly capable coastal states along Japan's Indo-Pacific sea lanes. These naval activities are, in some ways, a simple progression of Japan's long-standing policy to support maritime capacity development. However, this expansion reflects a loosening of Japan's domestic policy constraints and the increased comfort of Southeast Asian partners in hosting Japanese forces. The PRC's increasing capabilities and assertive maritime behavior have hastened this trajectory, given Japan's heavy reliance on the South China Sea and its concerns that the PRC's campaign to assert sovereignty there is strongly linked to its campaign against Japan in the East China Sea.

Japan's overarching strategic goal to promote the sustained safety and security of the critical Southeast Asian sea lanes has remained essentially unchanged for more than 50 years. However, Japan has incrementally expanded the range of regional security challenges it directly addresses and the agencies it mobilizes to assist in this effort. For the past decade or so, these agencies have included the Ministry of Defense and the JMSDF. The JMSDF now regularly deploys to the South China Sea and has a record of conducting high-end warfare exercises with the U.S. and other extra-regional navies in that contested body of water. It makes major contributions to multilateral exercises in the region and has been conducting bilateral capacity-building activities with regional navies. The activities should be expected to continue to expand with the primary limiting factors being the availability of ships and other fleet resources.

To date, the bilateral engagements in Southeast Asia have been almost entirely restricted to goodwill activities and modest projects focused on building regional partners' constabulary capacities. However, Japan can be expected to become more involved in assisting regional states with military defense capabilities. The deal to send new air defense radars to the Philippines sets a precedent in this regard. The PRC's continued maritime aggression will be an important driver, but Japan will remain concerned by other maritime threats and increasingly seek to diversify its defense relations beyond reliance on the U.S.

With the Ministry of Defense and JMSDF joining other Japanese agencies as direct participants in Southeast Asian maritime security, the region has clearly become a new nexus in Japan's maritime strategy. It is important for Southeast Asian states to realize that as Japan's self-restraint relaxes, they will face bigger decisions regarding the nature and scope of the defense relations they desire with Japan. \square

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ILLUMINATING DARK FLEETS

SATELLITE IMAGES REVEAL ILLEGAL FISHING

DR. JAEYOON PARK AND DR. JUNGSAM LEE. ET AL.

llegal, unreported and unregulated (IUU) fishing threatens resource sustainability and equity. A major challenge with such activity is that most fishing vessels do not broadcast their positions and are "dark" in public monitoring systems. Combining four satellite technologies, we identified widespread illegal fishing by dark fleets in the waters between the Koreas, Japan and Russia. We found more than 900 vessels of Chinese origin in 2017 and more than

700 in 2018 fished illegally in North Korean waters, catching an estimated amount of Todarodes pacificus (Japanese flying squid) approximating that of Japan and South Korea combined (more than 164,000 metric tons worth over U.S. \$440 million). Furthermore, we found 3,000 small-scale North Korean vessels fished, mostly illegally, in Russian waters. These results can inform independent oversight of transboundary fisheries and foreshadow a new era in satellite monitoring of fisheries.



In October 2018, world leaders pledged more than U.S. \$10 billion to protect the world's oceans. A major objective of this initiative is to reduce IUU fishing, which results in the loss of billions of dollars, threatens fish stocks and marine ecosystems, and jeopardizes the livelihoods and food security of legitimate fishers and communities. IUU fishing, however, is often conducted by "dark fleets" — vessels that do not appear in public monitoring systems—and is therefore difficult to guard against.

Although many dark vessels broadcast their positions on country-mandated vessel monitoring systems, these data are often tightly guarded, limiting usability for third-party oversight or transboundary management. Revealing the activities of dark vessels could address this information gap, improving transparency and accountability.

These challenges with dark fleets and IUU fishing are epitomized in the waters surrounded by North Korea, South Korea, Japan and Russia, where geopolitical tensions and disputed boundaries greate a vaccuum of a

disputed boundaries create a vacuum of shared data and management. In these poorly observed waters, the same stocks of Japanese flying squid are targeted by several fleets, including the Chinese distant-water fleet. Although the Chinese fleet has fished in North Korean waters since 2004, its fishing activity and catches are only intermittently published, and not since 2016.

This lack of information sharing prevents accurate stock assessment in a fishery where reported catches have dropped by 80% and 82% in South Korean and Japanese waters, respectively, since 2003. This inability to assess the stock is concerning considering the critical importance of squid in the region. Japanese flying squid is South Korea's top seafood by production value, one of the top five seafoods consumed in Japan and, until recent sanctions, was the third largest North Korean export.

In 2017, following North Korea's testing of ballistic missiles, the United Nations Security Council adopted resolutions to sanction the country, restricting foreign fishing after September 2017. These resolutions prohibit the procurement of seafood from North Korea, joint ventures between North Korea and other countries without U.N. approval and North Korea from selling or transferring fishing rights.

Because sanctions under Chapter VII of the U.N. Charter are binding and implemented via domestic law and policy, any violations of these sanctions by Chinese vessels since September 2017 would constitute a violation of public international law and domestic Chinese law. Despite this, the South Korean Coast Guard has observed hundreds of vessels crossing into North Korean waters, and random inspections of these vessels by the East Sea Fisheries Management Service suggest that they are of Chinese origin. Evidence of continued Chinese fishing

in North Korean waters is also supported by domestic Chinese documentation.

To illuminate the activities of dark fleets in one of the most contested regions of the world's oceans, researchers combined local expertise with four satellite technologies. Individual technologies have distinct limitations but, when combined, can provide an informative picture of fishing activity. Automatic identification systems (AIS)

provide detailed movement and identity information but are used by only a fraction of vessels. Satellite synthetic aperture radar (SAR) can identify all large metal vessels and penetrate clouds but lacks regular, global coverage of the oceans. The Visible Infrared Imaging Radiometer Suite (VIIRS) sensor has global, daily revisit time and can detect vessels with bright lights but is limited by clouds.

Last, high-resolution optical imagery provides the best visual confirmation of vessel activity and type but is also limited by clouds and, until recently, was not

available at high enough resolution and frequent enough revisit time to monitor fishing fleets spanning exclusive economic zones (EEZs). Although these four technologies have previously been used to estimate fishing and identify individual vessels, they have not been combined to publicly reveal the activities and estimated catches of entire fleets at this scale.



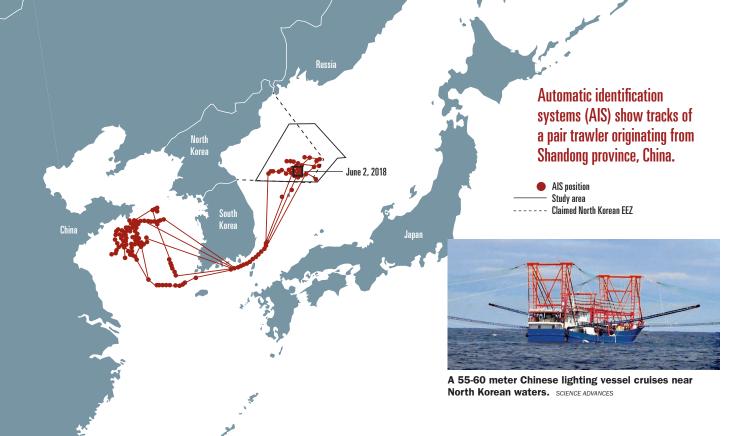
A Planet SkySat satellite captures an image of a Chinese lighting vessel.

SCIENCE ADVANCES

RESULTS

To monitor the activity of these vessels, we obtained 22 days of 3-meter resolution optical imagery from Earth-imaging company Planet's satellite constellation, PlanetScope, covering most of the claimed North Korean EEZ in 2017 and 2018. We then trained a convolutional neural network to identify pair trawlers in this imagery, as these vessels show a distinctive fishing pattern and comprise the largest proportion of foreign vessels in the region. (A pair trawler is one of two vessels towing a single trawl.) After identifying the location of the fleet with the neural network, we tasked Planet's 0.72-meter resolution SkySat satellites to image these vessels, further verifying that they are pair trawlers. We also used SAR imagery from three satellites to verify the location and size of the fleet. With these data, we estimated that at least 796 distinct pairs of trawlers operated in North Korean waters in 2017 and at least 588 did so in 2018. Only a fraction of these vessels broadcast AIS, but the signals from these AISbroadcasting vessels demonstrate that the vessels originated from Chinese ports and fished in Chinese waters.

To further verify their Chinese origin, we matched AIS detections from 140 of these vessels to Planet imagery. The AIS signals of these vessels corroborate the South Korean Coast Guard's inspections, confirming that they originated from China.



The second most common fishing vessels thought to be of Chinese origin in North Korean waters are large, 55- to 60-meter "lighting vessels" that use bright lights to lure target species; we identified these vessels by using low-resolution, high-sensitivity optical imagery produced by VIIRS at night. Although several fleets in the region use lights, Chinese vessels are known to be by far the brightest, carrying up to 700 incandescent bulbs and generating over 1,000 lux, equivalent to the light of some football stadiums. This brightness allows us to distinguish these vessels from other fleets in the area, and we confirmed this vessel classification by tasking Planet's higher-resolution SkySat to image an area where these bright vessels clustered.

VIIRS enabled us to estimate a minimum of 108 lighting vessels of Chinese origin operating in North Korean waters in 2017 and 130 in 2018. We also detected low-intensity lighting vessels, identified as the North Korean small-scale fleet. This fleet consists of small 10-to 20-meter wooden vessels with only five to 20 bulbs. We further verified vessel type through SAR and Planet imagery of the port of Chongjin, North Korea. We estimated that about 3,000 North Korean vessels fished in the Russian EEZ during 2018.

Data from these satellites also allowed us to quantify changes in vessel activity over time. For the North Korean small-scale vessels, we estimated that the number of fishing days has increased every year over a four-year period, from 39,000 in 2015 to 222,000 in 2018. For vessels originating from China, we estimated 91,400 fishing days during 2017 (82,600 by pair trawlers and 8,800 by lighting vessels) and 67,300 fishing days during 2018 (60,700 by pair trawlers and 6,600 by lighting vessels). These figures account for 70% in 2017 and 91% in 2018 of the number of fishing days one would estimate based on the number of Chinese vessels crossing into or out of North Korean waters each month, as counted by the South Korean Coast Guard.

If we conservatively assume that the catch per unit effort (CPUE) for pair trawlers and lighting vessels of Chinese origin is similar to that of smaller vessels in nearby waters, the total estimated likely Chinese catch would correspond to approximately 101,300 metric tons of squid worth U.S. \$275 million in 2017 and 62,800 metric tons of squid worth U.S. \$171 million in 2018. Such catch figures would approximate those of Japan and South Korea combined from all their surrounding seas.

DISCUSSION

This large number of previously unmonitored vessels poses a substantial challenge for stock management. A political stalemate due mainly to sovereignty conflicts and maritime boundary disputes has prevented regional joint fisheries management, while existing state-based efforts are ineffective because of a lack of shared vessel monitoring data, management arrangements and comprehensive stock assessments. For instance, to prevent overfishing, South Korea sets the total allowable catch for squid, limits the lighting power of squid jiggers, bans pair trawling and permits fewer than 40 small trawlers.

The likely Chinese fleet, however, targeting the same stock, uses brighter lighting power, pair trawling and a greater number of vessels. Given the declining CPUEs of South Korean and Japanese squid jiggers and the drastic decline in squid larval densities since 2003, the large number of vessels revealed through this study is particularly concerning.

In addition to sustainability concerns, there are substantial implications for fisheries governance and regional geopolitics. These vessels originate from China and, based on inspections by the South Korean authorities, are assumed to be owned and operated by Chinese interests. However, because the vessels often do not carry appropriate papers, they may plausibly be so-called three-no boats operating outside official Chinese authority, with no registration, no flag and no license to operate.

If these vessels do not have approval from both the Chinese and North Korean governments, they are fishing illegally; Chinese regulations require ministerial approval to fish in foreign waters, and the U.N. Convention on the Law of the Sea grants coastal states sovereign rights to manage living marine resources in their waters. Alternatively, if they are operating with approval from either or both governments, those state(s) are in violation of U.N. Security Council sanctions. Notably, the Chinese government has repeatedly refuted this latter scenario, confirming its support for the current sanctions. Regardless of the scenario, each results in the violation of either or both international and domestic law.

Bearing this in mind, our analysis identified over 900 distinct illegal vessels in 2017 after sanctions began and over 700 in 2018, representing the largest known case of illegal fishing perpetrated by a single distant-water fleet.

The presence of this foreign fleet also has severe consequences for North Korean small-scale fishers. Evidence suggests that competition from these larger trawlers displaces these small-scale wooden boats, shifting substantial effort to neighboring Russian waters. This kind of shift in response to foreign fleets has been documented elsewhere and is also consistent with local fisheries ecology in this region.

During the last trimester of the year, Japanese flying squid migrate south, through the Russian EEZ, providing an opportunity for the North Koreans to fish before the foreign fleets deplete the stock. A large portion of this North Korean fishing in Russian waters is, however, also illegal. The Russian government has authorized fewer than 100 North Korean boats since 2014, and in 2017, no permits were granted. In contrast, we estimated about 3,000 vessels fished in these waters during 2018. North Korean artisanal boats are severely underequipped for the long-distance travel required to reach Russian fishing grounds. As a result, between 2014 and 2018, 505 North Korean boats washed ashore on Japanese coasts.

These incidents frequently involve starvation and deaths, and local media report that many fishing villages on the eastern coast of North Korea have now been coined "widows' villages." The illegal fishing patterns documented here likely exert a heavy toll on fish and fishers alike.

We suggest that this analysis represents the beginning of a new era in satellite monitoring of fisheries. Multiple satellite sources have long been available to government agencies for targeted surveillance. However, it is only with recent increases in data availability, accessibility and computing power that these techniques can now be performed at large enough spatial and temporal scales — and by small, independent groups of researchers — to enable transparent fisheries monitoring. Although some aspects of this study are particular to the region (e.g., prevalence of pair trawlers), most techniques are easily transferable, such as matching AIS to vessel detections from freely available global satellite imagery or radar.



Chinese fishing boats sail in international waters around Ganghwa Island, South Korea. THE ASSOCIATED PRESS

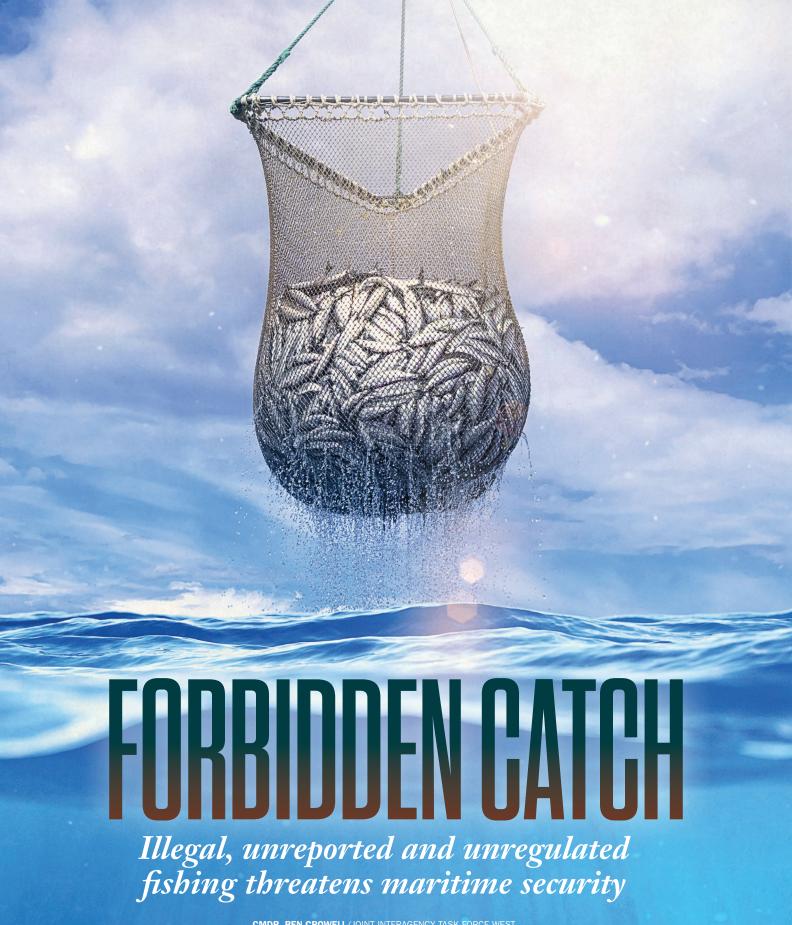
For the satellite data sources that are not yet freely available, such as commercial satellite radar or high-resolution optical imagery, the cost per image is decreasing rapidly. Combining these satellite technologies can reveal the activities of dark fleets, filling a major gap in the management of transboundary fisheries.

Furthermore, these technologies, when accompanied by local expertise, can identify potential hot spots of IUU fishing. Global fisheries have long been dominated by a culture of confidentiality and concealment, and achieving a comprehensive view of fishing activities at sea is an important step toward sustainable and cooperative fisheries management. \square

Editor's note: COVID-19 appears to have significantly impacted the number of North Korean boats sailing into the exclusive economic zone of other countries. For example, the number of boats believed to have originated in North Korea that drifted ashore on Japanese coasts between October 2020 and March 2021 fell 90% compared to the previous year, according to the Japan Coast Guard. Research for this report was conducted prior to the coronavirus pandemic and therefore reflects pre-pandemic behavior.

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CMDR. BEN CROWELL/JOINT INTERAGENCY TASK FORCE WEST AND WADE TURVOLD/DANIEL K. INOUYE ASIA-PACIFIC CENTER FOR SECURITY STUDIES

alued annually at U.S. \$277 billion, commercial fishing is a global industry that serves as a vital element of many national economies and an essential protein food source for maritime nations. As populations expand, so does fishing technology and the demand for seafood. Impacts from severe weather patterns coupled with increased consumption is a dangerous combination exacerbated by pressure from legal and illegal fishing. Through their illegal, predatory behavior, international fishing fleets are having an outsized impact on the environmental health, economic security and geopolitical stability of maritime nations around the world. Additionally, there are significant links between illegal, unreported and unregulated (IUU) fishing and human trafficking, drug smuggling and myriad other maritime crimes. Because of the global, networked and strategic nature of the problem, addressing the IUU fishing threat requires a coordinated international response.

THE THREE ELEMENTS OF IUU FISHING

IUU fishing has three elements, according to the United Nations. The first occurs when fishing operations are conducted within a nation's exclusive economic zone (EEZ) or within waters governed by a regional fisheries management organization (RFMO), in violation of national or RFMO laws. The second aspect pertains to misreporting or not reporting catches that fall under domestic or RFMO regulations. The third component entails vessels without nationality or fishing in an RFMO area without being a party to the RFMO, thereby not complying with its regulations, or fishing where there are no national or international regulations without regard to stewardship of the fisheries resources.

While the concept and terminology are not particularly threatening, these practices increasingly create ecological, economic and security challenges across the world's oceans. In a 2018 report by the Stimson Center titled "Casting a Wider Net: The Security Implications of Illegal, Unreported, and Unregulated Fishing," the authors identified six security threats associated with IUU fishing, including environmental damage, economic impacts, food security, geopolitical destabilization, transnational crime and piracy.

All these elements act as reinforcing feedback loops independent of each other. At the same time, they are interconnected and accelerate the problems and challenges surrounding IUU fishing.

THE STATE OF WORLD FISHERIES

As fishing stocks are depleted across the globe, distant-water fishing fleets and artisanal fishermen are putting greater stress on fisheries resources. In a 2018 report titled "The State of World Fisheries and Aquaculture," the U.N. observed that 33% of global fish stocks are overfished and 59.9% are at maximally sustained harvest levels. This increased pressure can create scarcity, driving up prices and thereby incentivizing more unlawful fishing



Indonesian officials detain Vietnamese fishermen accused of illegal fishing near Indonesia's Natuna Islands. AFP/GEITY IMAGES

and predatory behavior. The increased environmental pressure from overfishing and certain harvesting methods has led to ecological collapse of fishing grounds in the South China Sea and along the east and west coasts of Africa. With the destruction of natural resources, nations are faced with the twofold impact of the loss of a once-renewable economic resource and the loss of food harvested from the sea.

For many nations, this is no small issue. Several countries in the developing world obtain up to 50% of their protein from seafood products, according to the U.N. As fish stocks are depleted, individuals, families and communities are under greater pressure for basic survival. When faced with the cost-benefit analysis of starving or engaging in illegal activity to support one's family or village, most people will do what it takes to feed their community. Thus, the loss of environmental habitat and natural resources can create economic and food security issues for human populations, which in turn can drive maritime crime and piracy.

OVERFISHING LEADS TO PIRACY

The quintessential example of fishermen turned criminal is the piracy crisis that occurred off the coast of Somalia from 2006 to 2012. The nation fell into chaos in 1991 after the overthrow of dictator Mohamed Siad Barre, and the loss of central authority created large ungoverned spaces surrounding the Horn of Africa. Recognizing a lack of national enforcement, distant-water fishing fleets from the People's Republic of China (PRC) and perhaps other countries moved into Somalia's EEZ and collapsed fish stocks. This IUU fishing quickly put local fishermen out of work. With little opportunity for them to earn a living in other ways and with ready access to military-grade weapons, it wasn't long before piracy became a booming industry in the waters near the Horn.

Today, the challenge of Somali piracy has largely been suppressed through significant efforts involving a multinational naval task force and the widespread use of



Indonesian officers search the Panamanian-flagged MV Nika for illegally caught fish after detaining the vessel in Batam in July 2019. AFP/GETTY IMAGES

well-armed ship riders. There were only 11 attacks from 2016 through 2020, down from a high of 237 in 2007, according to the U.S. Office of Naval Intelligence.

The sequence of events that started with IUU fishing evolved to piracy and exacerbated a geopolitical challenge that continues to linger. This should be a cautionary tale of the dangers of IUU fishing.

Piracy hot spots persist in Southeast Asia and the Gulf of Guinea, where 417 and 544 attacks have occurred, respectively, since 2016, according to the intelligence office. Traditional patterns of smaller boats attacking larger, slower vessels to carry out armed robbery or kidnapping for ransom still work. Whether unemployed fishermen are conducting the most recent attacks is unclear. The telltales of proficiency with small boats, including operating them at sea against selected targets frequently far offshore — indicate a level of competency one would gain as a professional mariner.

OTHER CRIMINAL FACTORS ON THE HIGH SEAS

Armed robbery and piracy remain significant security concerns. In the context of the global maritime community, however, the numbers are statistically small. Perhaps a more significant concern is the general criminality associated with IUU fishing vessels, such as slavery and drug trafficking. In 2016, The Associated Press (AP) published a series of articles on slavery in commercial fishing fleets across the Indo-Pacific. In one instance, the AP detailed the tragedy of a man who was repatriated to

Burma after being kept at sea for 22 years without pay and under exceptionally poor conditions. In addition to forced labor, fishing vessels are being used to smuggle people worldwide. A U.N. report titled "International Migration 2020 Highlights" found that an estimated 653,000 "irregular" migrants arrived in Europe by sea routes from 2016-18. (Irregular migrant refers to the "movement of persons that takes place outside the laws, regulations or international agreements governing the entry into or exit from the State of origin, transit or destination," according to the report.) While the report didn't specify the type of vessels used, fishing boats had a role to play in this movement of people from Africa to Europe.

Another significant security concern is the link between drug trafficking organizations and commercial fishing vessels. Throughout the eastern Pacific Ocean, many of the vessels interdicted by law enforcement agencies are fishing boats that are trafficking drugs or supporting "go fast" smuggling boats that require fuel resupply. A 2011 U.N. report titled "Transnational Organized Crime in the Fishing Industry" noted that: "The use of fishing vessels is largely regarded as integral to the modus operandi of illicit traffic in cocaine at sea to Mexico and the United States."

This is substantiated by a recent U.S. State Department report that references the movement of drugs across the maritime domain by fishing vessels. The use of these boats masks illicit activity under the guise of legal commerce.

POWER PROJECTION

A somewhat recent and significant security challenge for the international community is the use of fishing vessels as an instrument of national power projection. The PRC stands out as the largest user of this tactic.

In the 15th century, China was a great maritime nation with large merchant ships transiting the IndoPacific region and engaging in international trade and exploration. These maritime quests were abandoned until after the end of World War II, when the first official map of territorial claims to the South China Sea appeared in 1947. In the late 2000s, the PRC began to more forcefully assert its maritime claims in the region through a series of land reclamation and artificial reef-building activities that continue today.

After the PRC took de facto control in 2012 of Scarborough Shoal, a reef within the Philippines' EEZ, the Philippine government took its case to the Permanent Court of Arbitration. The court found that the PRC had engaged in a broad spectrum of illegal fishing activities, construction projects that degraded the marine habitat and, in general, had "failed to exhibit due regard for the Philippines' sovereign rights with respect to fisheries in its exclusive economic zone." The PRC rejected the tribunal's findings and has refused to abide by them.

This finding summarizes many of the methods the PRC has employed throughout the region. Despite its violations of international maritime law, the PRC has taken things further by using coast guard vessels to provide armed escort for its fishing fleets into neighboring EEZs. The PRC has also used reinforced fishing vessels under the state control of a maritime militia to ram, attack and harass vessels throughout the region.

In several instances, this resulted in loss of life and abandoning mariners adrift at sea, breaching the timeless principle of seamanship — never leave a mariner in distress. Most recently, the PRC brought international attention to IUU fishing when it sent a massive flotilla of 340 fishing vessels to the waters near Ecuador and the Galapagos Islands as part of annual excursions to fish the global commons.

ADDRESSING THE THREAT

Most maritime security practitioners would say they need more resources — people, boats, planes, guns, training, etc. Certainly, this is an important enabler of success because even the most developed nations need more tools to counter maritime crime. Absent additional resources, one thing the international community can do to address the threats posed by IUU fishing is to board fishing vessels. Maritime security forces, whether military or police, need to board fishing boats making port calls and at sea. Law enforcement should use the full spectrum of domestic and international legal authority and jurisdiction to inspect the boats, the crews' documentation and food, the cargo, the reported catches, and the fishing gear and to interview crew members to determine their safety and health.

Authorities must seek to determine where and for what the boats are fishing and where and when they intend to return to port. Law enforcement must take every opportunity to engage with these fishermen and govern the activities of these boats as they move around the world on the high seas and in coastal waters. Additionally, coordinating the efforts of national law enforcement agencies will make international IUU fishing enforcement more effective. Connecting maritime security professionals will enable them to create shared databases. It also enables law enforcement agencies to coordinate among states to ensure there is no safe haven for criminal networks. The ability to do so is becoming more reachable.

Many coastal states are establishing national maritime coordination centers, often aided by the U.S. Maritime Security Initiative, a network to build regional capacity to address a range of maritime challenges. As these maritime fusion centers are developed, connecting them becomes the next step in enhancing their global effectiveness. Further, developed nations must rally behind developing countries that do not have the resources to police their EEZs.

Some illegal activity will be in the form of minor incursions by lone vessels looking for easy fish catches, while other EEZ incursions will be funded and directed by national governments, frequently with the support of armed militia or government vessels. Therefore, it is incumbent upon all maritime nations to prepare strategic, operational and tactical responses to the eventual probing of their EEZs by distant-water fishing nations.

Looking to the future, the global maritime community will see the use of IUU fishing as a tool for expanding criminal organizations and nation states. The actions of these actors are similar and frequently intertwined. Simply put, they seek any opportunity for profit and resources that are not legally theirs to take.

On paper, the basic IUU fishing enforcement tactics sound easy. They are not. The resource constraints and competing priorities of law enforcement agencies frequently make fisheries enforcement a secondary or tertiary mission. However, when taken in total, IUU fishing is much more than an environmental crime. It is a global, strategic challenge that must be met with a collaborative, international, strategic response. The businesses, vessels, owners and operators, sometimes state-sponsored, are functionally acting as transnational criminal organizations and are having an outsized impact on the ecological health, economic security, food security and overall maritime security of the world's oceans.

Whether in port or on the high seas, vessels and nations engaged in IUU fishing must have their actions disincentivized. Until the cost becomes greater than the reward for the countries, owners and operators of IUU fishing vessels, these criminal behaviors will continue across the maritime commons. \square

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OF THE FLEET

A Closer Look at the Chinese Fishing Vessels Off the Galapagos

DR. TABITHA GRACE MALLORY AND DR. IAN RALBY | PHOTOS BY REUTERS

A flurry of news stories in late July 2020 reported the discovery of a massive fleet of Chinese fishing vessels in the waters off Ecuador's Galapagos Islands, which fluctuated to over 350 before the fleet finally left by mid-October to fish farther south. Yet the presence of the Chinese distant-water fishing (DWF) fleet in the area has been expanding for several years. Concerns over the fleet's illegal, unreported and unregulated (IUU) fishing have also grown, spurred by the August 2017 seizure of the Fu Yuan Yu Leng 999, a Chinese-flagged refrigerated vessel found in the Galapagos with roughly 3,000 tons of rare, nearly extinct or endangered species onboard, including 600 sharks.

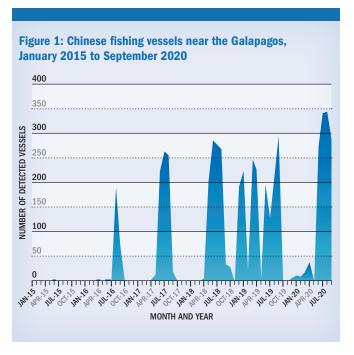
Using data and insight from Windward, a predictive maritime intelligence platform, our analysis examines how this fishing phenomenon has evolved over time and who is behind this increasingly intensive fishing effort. This fishing activity is the outcome of the People's Republic of China's (PRC's) global fisheries strategy, including the generous subsidies provided to the industry. We examine the extent to which the PRC may be engaging in IUU fishing, arguing that although the Chinese government has moved to curtail IUU fishing activities, several challenges remain. While the fleet appears to largely be operating legally, some behavior indicates exceptions. Furthermore, despite any seemingly technical compliance with existing laws and

A fishing boat is seen from an Ecuadorian Navy aircraft after a fishing fleet of mostly Chinese-flagged ships was detected in an international corridor that borders the Galapagos Islands' exclusive economic zone in the Pacific Ocean, on August 7, 2020.

regulations, some Chinese fishing activity falls into the unreported and unregulated categories and deserves careful consideration in terms of the sustainability of such operations.

NEW ATTENTION. BUT NOT NEW

Windward data helps to visualize the Chinese fleet's activity over time, illustrating that the presence of Chinese fishing vessels in the waters around the Galapagos' 370-kilometer exclusive economic zone (EEZ) has been increasing for several years. In 2015, there was virtually no Chinese fishing activity in the Galapagos and the waters outside the archipelago's EEZ. Beginning in 2016, however, that changed dramatically. In August 2016, for example, 191 Chinese-flagged vessels fished in the wider Galapagos area — a stark contrast to the one Chinese vessel that was detected in that area the same month in 2015. The numbers have increased since then, fluctuating with the fishing seasons. Over the course of 2017, three months saw more than 200 vessels fishing in the area, peaking at 263 in July. In 2018, there were four consecutive months — May through August — with over 200 Chinese vessels fishing in the area, and December had 193. The peak that year was 286 in June. In 2019, there were five months with over 200 vessels, while June and July had 197 and 130, respectively. The peak in 2019 was September, with 298 (Figure 1).



The phenomenon has now become more extreme, with four months in 2020 having over 200 vessels, including two with over 300. In July 2020, there were 342 Chinese vessels fishing in the area, in August there were 344 and in September there were 295.

To better understand this huge increase in activity, it is important to understand the policies driving the Chinese fishing industry.

UNDERSTANDING CHINA'S GLOBAL FISHING STRATEGY

Because of Windward's data aggregation capabilities, it is possible to examine some of the details behind this massive fleet. Between July and August 2020, 364 Chinese vessels in the area transmitted on an automated information system (AIS). Vessels over 300 gross tons operating internationally must, under the Safety of Life at Sea Convention, be fitted with AIS and keep it turned on. Therefore, there may have been more than 364 vessels because some may have been present but "dark" and thus undetectable through AIS. Examining those 364 reveals valuable insights into their ownership and provinces of origin. Notwithstanding a few vessels whose ownership is unknown, 55 companies own the fleet on paper, though several have identical addresses, indicating that there may be fewer than 55 beneficial owners.

The vessels off the Galapagos are part of China's DWF fleet, which operates in areas beyond national jurisdiction — or the "high seas" as defined under the United Nations Convention on the Law of the Sea (UNCLOS) — and in the EEZs of host countries on the basis of bilateral fisheries access agreements. The PRC officially reported 2,701 DWF vessels in 2019 and 159 DWF enterprises in 2017.

The fleet around the Galapagos is the result of distinct shifts in Chinese fisheries policy. From the launch of China's DWF industry in 1985 until the mid-2010s, the PRC's strategy was to expand the fleet and increase catch. Yet, in the PRC's 13th fisheries five-year plan — the most recent — the strategy shifted from a focus on expansion to one of upgrading and consolidating the industry. The PRC aims to have more control over the entire supply chain, from point of harvest, transport and landing, to processing and distribution and, ultimately, to retail markets. Concurrent with this shift, as the PRC upgrades its vessel technology to better process and store catch, it aims to send more of its DWF catch for sale on China's domestic market. The PRC has been building domestic port infrastructure for this seafood distribution. In 2018, it sent 65% of its catch home, an increase from 49% in 2009.

Simultaneously, the PRC has been moving away from reliance on catch from other EEZs toward high seas fishing because host countries have become more concerned about unsustainable fishing by foreign fleets in their waters and costs have increased. While some high seas areas are overseen by regional fisheries management organizations (RFMOs), there is no comprehensive regulatory body for fishing on the high seas with global scope. As high seas areas become increasingly regulated by the patchwork of RFMOs, fishing quotas may be distributed to fleets that have historical fishing presence in the area. A task force report published in 2010 by Chinese government, industry and academics argued that countries with a longer history of using the ocean have more power in determining how resources are distributed and thus receive a larger share of those resources — "occupying brings about rights and interests." In accordance with these trends, China's DWF fleet caught 66% of its catch from the high seas in 2017, compared to 43% in 2010.

Chinese investment in this strategy is reflected by which provinces these vessels call home. Of the 364 vessels found operating outside the Galapagos in July and August 2020, 92 could not be linked definitively to a specific owner. Of the remaining 272, 188 were from Zhejiang province. Because Chinese vessels owned by the same company tend to have uniform names distinguished by different numbers, it is likely that 50 vessels without company names are also from Zhejiang because of similarities in their names. Therefore, two-thirds (238) of the fishing vessels are likely from Zhejiang. Of the remainder, 46 are from Shandong province, plus 19 more likely from Shandong, for a total of 65, or 18% (*Figure 2*).

It is no coincidence that Zhejiang and Shandong are the home provinces for 83% of the fleet. They are the largest recipients of at least one DWF fisheries subsidy program, each receiving about 2.1 billion Chinese yuan (U.S. \$324.6 million) from the central government from 2018 to 2019. The third-largest recipient, Fujian province, which accounted for the next largest batch of fishing vessels, received 1.181 billion yuan (U.S. \$182.5 million) in government subsidies during the same period. These three provinces were also the top producers of the PRC's official total DWF catch, which amounted to 2.257 million tons in 2018 (*Figures 2 and 3*).

As the PRC aims to increasingly bring its global catch home, these three provinces are also the location of three new or planned ports dedicated to landing DWF catch. Zhejiang brings in the largest share of China's DWF catch (24% in 2018). Thus, in 2015, the first national DWF fishing port was proposed for Zhoushan, Zhejiang.

Figure 2: Share of fishing vessels near the **Galapagos by Chinese province** Liaoning Hebei Shanghai 1% 1% 1% Unknown Beijing 5% 1% Jaingsu 2% **Fujian** 6% **Shandong** 18% Zhejiang 65% Source: Dr. Tabitha Grace Mallory and Dr. Ian Ralby

Zhoushan National DFW Base, supported by government funding, serves to promote DWF seafood to the domestic market, with port infrastructure to support the docking of 1,300 fishing vessels, processing and storage facilities, throughput for 1 million tons of catch annually and a shipbuilding center. Squid is the main species landed at the port, facilitated by its China DWF Squid Trade Center.

Shandong, the country's third-largest producer of DWF catch (20% in 2018), is home to the second port, Shawodao National DWF Base, approved for construction in 2016 in the city of Rongcheng. With similar support facilities, Shawodao will be able to dock 1,000 fishing vessels and handle the trade of 600,000 tons of fish, including squid and tuna. Fujian, home to the PRC's first group of DWF vessels and its second-largest producer of DWF catch (21% in 2018), will host the third port, Fuzhou (Lianjiang) National DWF Base in the city of Fuzhou, which was approved for construction in 2019.

The changing patterns in the PRC's DWF policies are also reflected in the trade and catch data. The PRC's squid imports from Argentina and Peru have fallen (*Figure 4*), while its own catch has risen, possibly because it decided to catch squid through its DWF fleet. Zhejiang's squid catch grew from 69,000 tons in 2009 to 356,000 tons in 2018, while Shandong's squid catch grew from 21,000 tons to 102,000 tons over the same period, according to the PRC's official statistics.



Figure 4: Chinese imports of squid from Argentina and Peru by volume in tons, 2012-2016

| | Argentina | Peru |
|------|-----------|--------|
| 2012 | 10,322 | 95,513 |
| 2013 | 24,600 | 71,598 |
| 2014 | 23,262 | 82,210 |
| 2015 | 7,095 | 52,839 |
| 2016 | 2,321 | 9,721 |

Source: Dr. Tabitha Grace Mallory and Dr. Ian Ralby

IUU FISHING IN THE GALAPAGOS EEZ?

Visualizing even a portion of the fishing activities in July and August 2020 is instructive on a few fronts. Based on Windward's algorithmic analysis of AIS data, each dot on the image below represents a Chinese vessel fishing during that period (*Figure 5*).

Not a single dot appears within the Galapagos' EEZ, the edge of which is almost perfectly outlined by the dots. This is consistent with statements made by Ecuadorian President Lenin Moreno on Twitter, namely that his nation's focus is on protecting the EEZ.

The Chinese fleet is not permitted to fish in Ecuador's EEZ, and, insofar as the AIS data indicates, the fleet

appeared to be only on the high seas and not in the EEZ.

This contrasts with past behavior. Take, for example, the visualization of activities in July and August 2017, when Chinese vessels fished within the Galapagos' EEZ (*Figure 6*).

These illegal fishing activities culminated in the arrival of the Fu Yuan Yu Leng 999 in the EEZ on August 12, 2017. Three days later, the vessel was seized, and the captain and crew ultimately were sentenced to four years in prison and fined U.S. \$6.1 million. The operators may have believed that the refrigerated cargo vessel, unlike a fishing vessel, was not likely to be detected, much less seized for its involvement in illegal fishing. As reported, however, the cargo vessel was transshipping illegal catch from "dark" fishing vessels at sea, though these fishing crews were never arrested and prosecuted for their illegal activities (*Figure 7*).

Judging from the AIS activity and the PRC's policy responses, the incident made the Chinese fleet more cautious. The PRC created an IUU fishing blacklist by the end of 2017, removed some subsidies to punish vessels caught engaging in IUU fishing, created a DWF training and compliance center and capped the fleet at 3,000 vessels. In February 2020, the Chinese Ministry of Agriculture and Rural Affairs revised its DWF regulations, formalizing the prohibition on IUU fishing and calling on vessels to leave a buffer around off-limit areas. While the regulations do not specify the buffer's

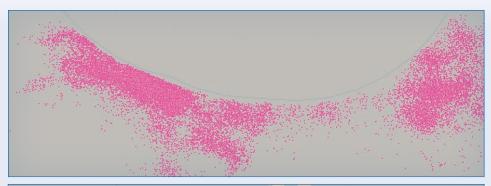


Figure 5: Fishing activity by the Chinese fleet in July and August 2020.



Figure 6: Fishing activity by the Chinese fleet in July and August 2017.



Chinese fishing operation

Outer limit of Ecuadorian EEZ around Galapagos Islands



size, a follow-on notification on DWF safety determined it to be 1.85 kilometers.

IUU FISHING ON THE HIGH SEAS?

While the fleet does not seem to be illegally fishing in the Galapagos EEZ, the vessels are subject to RFMO rules that govern fishing on the high seas. Tuna fishing in this area is managed by the Inter-American Tropical Tuna Commission (IATTC), an RFMO of which the PRC is a member. The IATTC sets annual quotas for tuna species and keeps lists of registered fishing and transport vessels, as well as vessels caught engaging in IUU fishing. The PRC has 415 longline tuna vessels registered with the IATTC. Of the 364 vessels fishing outside the Galapagos EEZ in July and August 2020, only one was registered with the IATTC.

The majority of the fleet is under the jurisdiction of the South Pacific Regional Fisheries Management Organization (SPRFMO), which regulates high seas species aside from tuna, such as jack mackerel and, now, squid. Of the 363 vessels fishing outside the Galapagos EEZ not registered with the IATTC, all but 16 were registered with the SPRFMO. As one of the newer RFMOs, established in 2012, its species coverage is still growing. China began fishing jack mackerel with 15 vessels in 2003 after conducting exploratory catch missions in 2001 and 2002. China's jack mackerel catch grew from 14,000 tons in 2005 to 61,229 tons in 2018, with Shandong province accounting for 65%, followed by Zhejiang province at 24%.

The first large-scale regulation of high seas squid came in 2020. The SPRFMO issued measures to regulate jumbo flying squid fishing, which entered into force in 2021. Until then, China's squid fishing was not illegal but rather unreported, and the PRC may have been establishing the largest fishing presence possible and taking advantage of the absence of regulations. Also in 2020, the Chinese government initiated the first moratorium on high seas squid fishing, including an area adjacent to the Galapagos. This suggests that the PRC

recognizes that its fleet's fishing levels are so unsustainable as to be undermining its long-term interests.

After all, 700 of the 1,135 vessels registered to the SPRFMO, or 62%, are flagged to China. The next two largest fleets number 127 and 99, flagged to Panama and Peru, respectively.

THE REMAINING CHALLENGES

While the Chinese fleet seemed to have avoided illegal fishing in the Galapagos EEZ and is largely registered with the relevant RFMOs, there is still cause for concern. Vessels can turn off their AIS transponders and go dark. There are concerns with the flagging of Chinese vessels to other countries and issues with transshipping catch. Similar vessel names and changes in reported vessel measurements increase law enforcement challenges. Finally, even if it is legal, this fishing activity is not necessarily sustainable.

The Chinese fleet may have done one of three things to avoid either breaking the law or appearing to break the law:

- Stayed just outside the EEZ.
- Sent only dark vessels into the EEZ.
- 3. Used non-Chinese-flagged vessels to provide catch from within the EEZ and transshipped on the high seas.

By concentrating so many vessels outside the EEZ, with AIS on, the approach may be to distract from any dark incursions into the Galapagos' waters or to hide the transshipments with other vessels in plain sight. The picture of fishing activities in July and August 2020 when looking at all vessels, not just Chinese, shows that 554 vessels engaged in fishing operations, many of them inside the EEZ (Figure 8).

Delving into the data further indicates that 363 of those vessels engaged in fishing operations and met with another vessel, suggesting transshipment or bunkering, the process of supplying fuel to ships. Not surprisingly, most vessel meetings were Chinese-to-Chinese or Ecuadorianto-Ecuadorian. Excluding those meetings, and further excluding passenger craft, there were only 20 vessels of

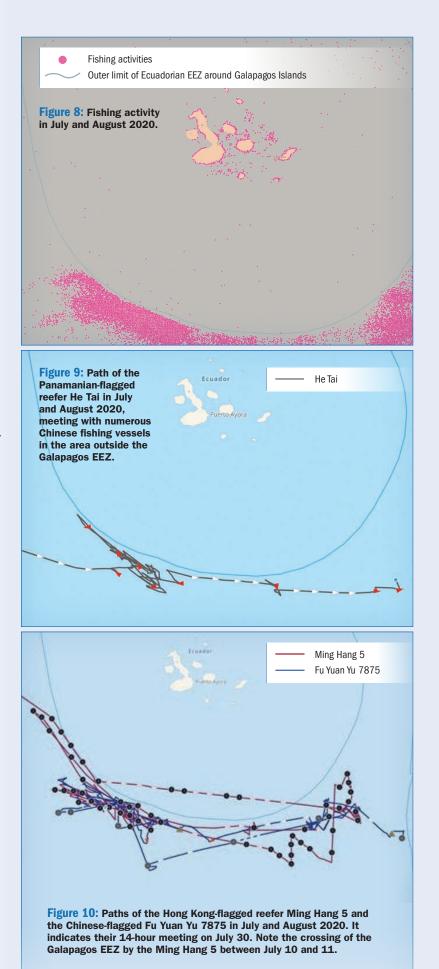
note. The overwhelming majority of those are Chinese-owned and Panamanian-flagged, and most are refrigerated cargo vessels — the sort used to transport fish.

THE 'REEFERS'

The behavior of the refrigerated cargo vessels, or "reefers," shows that the fleet may have learned from the Fu Yuan Yu Leng 999 experience. The He Tai, for example, is owned by a Chinese company with the same address as the Chinese company that operates the vessel. The address is in the same area as other companies that own and operate some of the fleet's Chinese-flagged vessels. The He Tai is flagged in Panama and has never crossed into the Galapagos EEZ. It has, however, rendezvoused with 25 of the 364 Chinese vessels that were fishing in the area, two of them twice (Figure 9). While not necessarily illegal, this reflagging is generally seen as a way to seek lower standards for fishing operations. China has announced new measures regulating transshipment of catch on the high seas, although it's unclear whether these would cover transshipment to vessels flagged to other countries.

Other examples suggest issues with dark vessels and altered vessel measurements. Take, for example, the Ming Hang 5, a Hong Kong-flagged reefer that in July and August 2020 rendezvoused 42 times with the Chinese fishing fleet. The behavioral patterns indicate suspicious activity. On July 13, the Ming Hang 5 met with six of the Chinese fleet and changed its draft three times from 0.0 to 6.8 to 0.0 and back to 6.8 — a tactic indicative of efforts to obscure the vessel's real draft and any changes to it arising from fishing or transshipment. Furthermore, after the six meetings, it deviated course. Looking closely at those meetings shows that the Gang Tai 8 was dark for the four days prior to meeting the Ming Hang 5, and the Ming Zhou 622 was dark for 10 hours the day before. Similarly, on July 30, the Ming Hang 5 changed its draft between 0.0 and 6.8 five times and had a 14-hour meeting with the Fu Yuan Yu 7875, which spent 13 hours of the previous day dark (Figure 10). The Fu Yuan Yu 7875 has the same owner as the Fu Yuan Yu 7862, which was the last vessel known to meet with the Fu Yuan Yu Leng 999 before its seizure in August 2017.

As Figure 10 indicates, the Ming Hang 5 crossed the Galapagos EEZ between July 10 and 11.



Just before entering the EEZ on the morning of July 10, it changed its registered length from 172 meters to 150 meters. That evening, it changed its draft from N/A to 6.8 and its length back to 172 meters. Two hours later, it changed its draft from 6.8 to 0.0 and its length to 150 meters. Less than an hour later — just after midnight — it changed the draft to 6.8 and the length to 172 meters. This back-and-forth continued several more times before the vessel departed the EEZ. The Ming Hang 5's confusing pattern of conduct, along with its other erratic draft changes, indicates an effort to obfuscate its activity and intended purpose. A look at its sister vessel, under common ownership, provides an interesting comparison. The Ming Hang 7 had 54 meetings with the Chinese fleet before heading for China with 119% of its cargo capacity by tonnage. In other words, despite not calling at any ports, it was overfull, strongly indicating fisheries transshipment.



An Ecuadorian Navy officer examines images of fishing boats after a fleet of mostly Chinese-flagged vessels was detected near the Galapagos Islands' exclusive economic zone August 7, 2020.

This dynamic is consistent with some of the other reefers. The Yong Hang 3 repeatedly changed its draft between 6.5 and 0.0, making it impossible to determine how its 19 meetings with the Chinese fleet affected its actual draft. The Shen Ju had been in the area since April 2020 and constantly switched its draft between 7.8 and 0.0, making it impossible to determine the effect of its 55 meetings with the fleet. The Shun Ze Leng 6 only took that name when it changed ownership March 29, 2020. Afterward, it never called at a port but did meet 50 times with the Chinese fleet and added a half meter of draft before heading back to China at 83% of capacity by tonnage. The Yong Xiang 9 had been in the area since April 2020 without making a port call, meeting with the fleet 18 times before heading back to China.

All of this points to a systematic attempt to transship

the catch on the high seas to bring it back to China. The obfuscation tactics may be a mix of concern about reputational harm and uncertainty about applicable law.

THE TANKERS

Of the 20 reefers, six are tankers. One is unidentifiable, suggesting it was operating illegally, although it only had two meetings with vessels in the Chinese fleet, both with the Lu Rong Yuan Yu 939. The B. Pacific, which only had one meeting, is the sister tanker to the B. Atlantic, which is well known for bunkering in the Gulf of Guinea. Interestingly, that meeting was with the Fu Yuan Yu 7876, sister vessel to the 7875 and 7862. The Hai Soon 26 engaged in eight meetings but only entered the area in late August 2020 and left in early September, suggesting it was possibly taking advantage of the high concentration of vessels for bunkering. Conversely, the

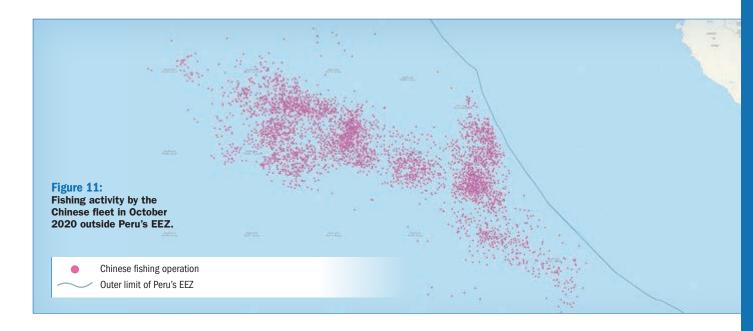
remaining three tankers — the Hai Xing (39 meetings), the Hai Gong You 303 (69 meetings) and the Ocean Splendid (89 meetings) — all seem to have been in the area specifically to service not only the Chinese fleet but also reefers such as the Shun Ze Leng 6 that appear to have been transshipping with the fishing vessels. While such bunkering is not illegal, it is indicative of the operation's extent because maintaining the Chinese fleet at sea requires a variety of service vessels, including tankers.

TWINS

Another questionable practice is the use of the same name for different vessels, which can make interdiction more difficult by allowing the vessels to point a finger at each other. An interesting example is the United Kingdom-flagged Zhou Yu 921, not to be confused with the Chinese-flagged Zhou Yu 921, which is part of the Chinese fleet. The

British vessel is 33 meters long, and the Chinese vessel is 51 meters. While the British vessel's owners cannot be verified, there is substantial reason to suspect a close relationship to its Chinese-flagged namesake because the vessels met 19 times in July and August 2020.

In three other cases, different vessels had the same name and International Maritime Organization (IMO) number. Both the Chang An 168 and the Chang Tai 812 shared a name and IMO number with another vessel, though, in the latter case, the vessels had different Mobile Maritime Service Identity (MMSI) numbers. One name, the Jin Hai 779, was used by three vessels fishing in the area, each of which also used identical IMO and MMSI numbers. Such use of identical names and identifying numbers by multiple vessels is illegal. Additionally, two vessels had similar names, the Jia De 12 and the Jia Da



12, but only the former was on the SPRFMO list of registered vessels.

CONCLUSION AND POLICY RECOMMENDATIONS

This analysis examined the Chinese fleet around the Galapagos to better understand its macrobehavior over time, the industry drivers and some of the fleet's recent tactics, and to ascertain whether IUU fishing is occurring. In most cases, what is detectable may not be illegal, and the Chinese fleet clearly is taking care to give the appearance of compliance with national and international laws. As the recent changes in Chinese policy suggest, some of this compliance is likely genuine. China cares about its international reputation, and knowledge about marine environmental protection is growing there.

At the same time, the PRC's competing domestic priorities are resulting in what is likely some illegal fishing and definitely unreported and unregulated activity, requiring different policy responses. The evidence suggests that dark vessel activity and multinational shell games are obscuring illegal fishing inside the Ecuadorian EEZ around the Galapagos. If Ecuador can more closely monitor the activities not just of the fleet, but of the companies that own it and the vessels that service it, a more complete picture can be drawn.

The fishing activities on the high seas outside the Galapagos EEZ are unregulated, and the total fishing effort seems unsustainable and irresponsible from an environmental standpoint. The fleet likely would not be able to operate without the enormous subsidies the Chinese government provides every year. In 2018, China provided an estimated 21% of all global fisheries subsidies and 27% of the harmful global subsidies. The deep pockets of the Chinese government result in a global fishing fleet that exceeds the size of any other.

While this analysis focused on the peak months of July

and August 2020 around the Galapagos, the phenomenon has by no means ended — most of the vessels moved south and, as of mid-October 2020, were concentrated in the high seas outside the central and southern portions of the Peruvian EEZ (*Figure 11*).

The response to high seas fishing must be global. Scientific understanding of high seas fisheries is not as robust as that of coastal fisheries, and thus a precautionary approach is important. Not only does unsustainable fishing threaten long-term food security and the industry's economic viability, it may decrease marine biodiversity, which is already under threat from climate change. At the national level, the U.S. Seafood Import Monitoring Program could be expanded to cover squid, which is the main genus the fleet targets. Regionally, organizations such as the Comision Permanente del Pacifico Sur, which represents the collective fisheries interests and management of Chile, Colombia, Ecuador and Peru, can collaborate on high seas management and protection. At the international level, we must support the U.N. efforts to establish an agreement on protecting biodiversity in areas beyond national jurisdiction. The outcome of the World Trade Organization negotiations on fisheries subsidies will also be crucial. The PRC is seeking exemptions, arguing that it is still a developing country.

Development, however, can never be to the detriment of the entire planet, and unsustainable fishing practices around the world have put extreme pressure on global fish stocks and dramatically diminished ocean health. Our ability to sustain human life depends on our ability to maintain the resources needed for our sustenance. As much as this matter is up for legal, political or environmental debate, it is most fundamentally a concern for all humanity. \square

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Peace for Peace and Translaty

U.S. NAVY AT HEART OF VISION FOR FREE AND OPEN INDO-PACIFIC

CAPT. JOHN GAY/U.S. PACIFIC FLEET

panning more than 163 million square kilometers of ocean, the Indo-Pacific region is highly diverse — linguistically, culturally and geographically. With more than U.S. \$3 trillion in goods transiting through the South China Sea alone, the region is considered one of the most contested in the world. Competition, however, does not have to mean conflict.

To compete in today's global economy, all nations in the region, as well as others around the globe, depend on a Free and Open Indo-Pacific and the assured flow of trade.

The United States has always had strong economic and political ties to the Indo-Pacific and has maintained steadfast relationships and a maritime presence throughout the region. Working closely with like-minded nations, the U.S. has helped maintain security through shared values and adherence to international norms and laws, which has facilitated rapid growth and prosperity for Indo-Pacific nations. One of the most effective ways the U.S. maintains its forward-deployed presence is through the capability of its Navy.

For more than 75 years, the U.S. Navy has deployed alongside regional partners and allies, providing a range of support, including humanitarian assistance and disaster response (HADR), training, safeguarding international law and freedom of navigation, and maritime security. The Navy cooperates closely with regional partners in building enhanced maritime capability and maritime domain awareness to address potential threats in their territorial waters and exclusive economic zones.

Today's competitive environment has seen an increase in unlawful maritime incursions as demand increases for limited resources in the South China Sea. New geopolitical realities, expanding warfighting domains and emerging technical capabilities are challenging the status quo and disrupting the established cooperative relationships and shared values throughout the Indo-Pacific.

The U.S. and its regional partners' position on the South China Sea is simple: Support a Free and Open Indo-Pacific grounded on a rules-based order that upholds the sovereign rights of all nations, regardless of size, power or military capabilities, so every nation can pursue national objectives in accordance with international law.

COUNTERING ILLEGAL CLAIMS

In stark contrast to this vision and cooperative approach, the People's Republic of China (PRC) promotes a drastically different objective in terms of governance, trade, human rights, sovereignty and intellectual property protections. The Chinese Communist Party (CCP) represents the greatest long-term threat to security in the 21st century, not only in the Indo-Pacific but also around the globe. In the Indo-Pacific, one of the

greatest challenges is the PRC's relations with its neighbors, including nations with competing island claims.

The South China Sea sits atop large oil and gas reserves, and Beijing unlawfully claims all rights to those untapped resources. It appears that the CCP is seeking to replace the established rules-based international order with one in which Chinese national power dictates new norms and behaviors aligned with CCP objectives.

Since 2013, the PRC has used its state-owned enterprises to dredge and lay claim to more than 1,295 hectares of land — nearly 19 times as much as all other claimants combined — and destroyed pristine reefs to develop artificial features in the South China Sea. Many of these outposts in the Spratly and Paracel islands have been fortified and militarized with airfields, ports, fighter jets, surface-to-air missiles, radar domes and other facilities and capabilities despite the PRC's promise that they would not be used for military purposes.

In 2016, an international tribunal in The Hague found that the PRC had no legal basis to claim historic rights to resources within its arbitrarily drawn "nine-dash line" in the South China Sea. The tribunal also expressed concern over damage to the marine environment and coral reefs resulting from the PRC's careless large-scale reclamation and construction of artificial features in the Spratly and Paracel islands. The PRC's blatant disregard for the environment violates its obligation to preserve and protect fragile ecosystems and the habitat of

depleted, threatened or endangered species.

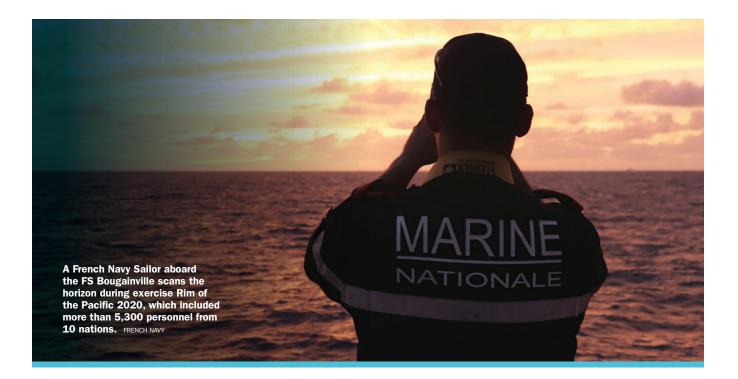
In rejecting the tribunal's ruling on its unlawful and harmful environmental practices, the PRC said that its claims over strategic reefs and atolls give Beijing total control over disputed waters of the South China Sea — a claim not recognized by international law.

To this day, the PRC continues to aggressively patrol contested waters to enforce its unlawful claims, using methods such as supporting illegal fishing operators and establishing a maritime militia composed of a covert fleet of fishing trawlers to support the People's Liberation Army (PLA). Hundreds of these Chinese militia vessels have been spotted loitering near Philippine-claimed areas of the West Philippine Sea and throughout the South China Sea. The militia coordinates with China's coast guard to harass fishing and military vessels and oil and gas rigs of smaller Southeast Asian states that publicly reject Beijing's sweeping claims over the South China Sea.

In addition to aggression toward lawful economic activity by Association of Southeast Asian Nations (ASEAN) countries, the PLA Navy also confronts other nations' naval vessels. Since 2016, the U.S. Navy has had at least 20 unsafe or unprofessional encounters with PLA forces in the Indo-Pacific, in the air and at sea. In one encounter, a Chinese destroyer came within 40 meters of a U.S. warship, forcing it to maneuver to avoid a collision.

In 2020, a Chinese military vessel rammed and sank a Vietnamese fishing boat off the





disputed Paracel Islands, the second such incident in less than a year. In April 2020, a Chinese navy ship targeted its gun control director on a Philippine Navy ship patrolling in disputed waters, which is considered unacceptable in common military practice. No ASEAN member state is safe from the PRC's growing assertiveness in the region, and the CCP's illegal enforcement creates a dangerous environment for lawful mariners.

GUARANTOR OF GLOBAL TRADE

The PRC's direct threats to neighboring nations combined with its "wolf warrior" diplomacy, unwillingness to negotiate on the South China Sea and assertiveness across the Indian Ocean and South Pacific run counter to a Free and Open Indo-Pacific. Beijing's use of coercion, influence operations, and economic, military and diplomatic threats to bully states to accommodate the CCP's interests undermines other nations' sovereignty, threatens regional stability, increases tensions and weakens a credible view of China.

The U.S. Navy's dominance of the world's oceans has made it an indispensable foreign policy tool and a guarantor of global free trade. The U.S. Navy's forward-deployed presence and close relationships with allies and partners create opportunities to work together and increase combined operations, exercises and training throughout the Indo-Pacific region. These opportunities include maintaining cooperative maritime deployments, HADR, information sharing and continued freedom of navigation

operations. Through such activities, the U.S. Navy bolsters regional maritime security and readiness, improves responsiveness and provides a foundation for stronger deterrence and a more secure environment.

At the heart of this vision is the Japan-U.S. security alliance. The depth of the U.S. commitment to Japan is supported by nearly 55,000 U.S. military personnel stationed there and the ability to forward deploy the most capable and advanced U.S. military assets to Japan. The Japan Maritime Self-Defense Force (JMSDF) participates in many U.S. bilateral and multilateral exercises, increasing readiness and interoperability between the two navies. In 2020, the JMSDF participated in the Malabar and Rim of the Pacific exercises, which provided unique training opportunities designed to foster and sustain cooperative relationships critical for enduring regional stability.

Commander, U.S. Naval Forces Korea (CNFK), partners with the Republic of Korea in naval matters to enhance operational effectiveness and strengthen collective security efforts in South Korea and the region. CNFK works closely with its counterparts and coordinates U.S. Navy participation in several major joint and combined exercises.

Along with the U.S., Japan and South Korea, ASEAN, Australia, Canada, France, India, New Zealand and the United Kingdom have put forth similar visions for a Free and Open Indo-Pacific.

In 2017, the Quad, a strategic grouping composed of Australia, India, Japan and the

U.S., was re-formed. The four nations share a vision based on common interests and values to strengthen rules-based order in the Indo-Pacific region.

Malaysia and Singapore also are vital partners in the region. Malaysia's security and defense cooperation provides critical assistance in areas such as combating human trafficking, counterterrorism and maritime piracy. Singapore supports the U.S. Navy with a maintenance and resupply hub, offers a regional base for more than 1,500 U.S. companies and continues to be a strong partner on a broad range of priorities, including climate change, counterterrorism, counterproliferation, regional maritime security and HADR. "Singapore hopes the United States will further broaden and deepen its presence in the region and welcomes a continued U.S. security presence," Singaporean Prime Minister Lee Hsien Loong said during the eighth ASEAN-U.S. Summit in November 2020.

PARTNERS FOR PEACE, PROSPERITY

No other navy has the global reach of the U.S. Navy, which continuously operates in the Pacific, Atlantic and Indian oceans, as well as in and around the Arctic, Mediterranean, Arabian Gulf and Horn of Africa. What makes the U.S. Navy stand out are its 10 aircraft carriers, 31 amphibious ships, 54 nuclear attack submarines, 14 Ohio-class ballistic missile submarines and four Ohio-class guided-missile submarines. The U.S. Navy's multiple cruisers and destroyers are extremely versatile surface combatants capable of supporting carrier strike groups and amphibious forces, of operating independently, and of providing multimission tasking, including air, surface and undersea warfare and naval surface fire support.

By its use of the oceans, which cover nearly three-quarters of Earth's surface, a strong navy can do things that land-based forces cannot. It can provide extraordinary access to points of interest around the globe, patrolling vital waterways and maneuvering to distant shores and population centers. In addition to its combat capability and security mission, a navy can provide unique capability for HADR.

Between 1991 and 2018, U.S. Indo-Pacific Command (USINDOPACOM) conducted 27 HADR missions in the Indo-Pacific. Following the 2004 Sumatra-Andaman undersea megathrust earthquake and tsunami in the Indian Ocean that killed more than 27,000 people in 14 countries, the coordinated multinational response provided swift assistance and set the foundation for future cooperative responses. The goodwill generated by this operation proved so effective that the

U.S. Navy created Pacific Partnership, an annual multinational, multiagency deployment to build on HADR response.

Co-led by U.S. Pacific Fleet (PACFLT), the partnership is designed to improve the interoperability of military forces, government agencies and humanitarian organizations during disaster relief operations, while providing humanitarian, medical, dental and engineering assistance throughout the Indo-Pacific. Since 2006, Pacific Partnership has strengthened relationships and security ties among participating nations and provided valuable assistance to further regional resiliency.

The U.S. Navy seeks to preserve peace and stability throughout the Indo-Pacific, uphold freedom of navigation in a manner consistent with international law, maintain the unimpeded flow of commerce and oppose any attempt by any nation to use coercion or force to settle disputes. The U.S. Navy does not do this alone. The improved interoperability, information sharing and collective capabilities of allies and partners enhance overall coordination and ensure a continued Free and Open Indo-Pacific that allows all nations to prosper.

Although the U.S. Navy and its allies and partners have increased security operations throughout the South China Sea to discourage the PRC's continued development and unlawful claims, the PRC has not cooperated with its neighbors. This continues to intensify tensions in the region that could lead to conflict.

Recently, representatives from the U.S. Department of Defense, the U.S. Joint Chiefs of Staff and USINDOPACOM met virtually with members of the PRC's Central Military Commission's Office for International Military Cooperation, its Joint Staff Department and the PLA Southern Theater Command to convene a two-day Crisis Communications Working Group. The goal was to build mutual understanding between the two nations to prevent and manage a potential crisis and reduce risk to forces.

The meeting was a good first step to preventing conflict, but the PRC must reevaluate its South China Sea policy, recognize international law and create a cooperative environment with its neighbors to ensure that the Indo-Pacific remains free and open and peaceful and prosperous for all. \square

Capt. John Gay is the public affairs officer for U.S. Pacific Fleet. He enlisted in the U.S. Navy in 1988 and was selected for commission in 1998. Gay has served in a range of operational assignments in the Pacific and Middle East, ashore and afloat. A graduate of the Air War College, he holds advanced degrees in business and strategic studies.

IPDF VOICE

MARITIME SECURITY EFFORTS GROW IN THE PHILIPPINES

DR. SCOTT EDWARDS

he Philippines faces a large array of security issues, including kidnappings that fund terrorist activities; piracy in an area in which over U.S. \$40 billion worth of cargo flows; trafficking of drugs, weapons and people; cigarette, alcohol and fuel smuggling; and illegal fishing that not only destroys marine habitats but damages the nation's economy.

At a policy level, however, the Philippine government and Navy continue to focus on traditional areas of geopolitics — primarily concern about the People's Republic of China's overlapping claims in the South China Sea. This can divert attention from the wide range of transnational organized crimes taking place in the waters of the Philippines.



The diversity of maritime threats complicates enforcement. The Navy, Coast Guard, National Police Maritime Group and National Coast Watch Center (NCWC) form the core of a web of institutions mandated to contribute to aspects of maritime security. They are unified by their primary concern: a lack of capability, mainly understood as physical assets. Lobbying for greater resources is often difficult, and maritime security budgets remain dominated by the Navy. In consequence, Coast Guard and Navy members have suggested that education and advocacy are required to raise awareness of the scope of maritime security issues. So far, this has been done through a Maritime and Archipelagic Nation Awareness Month campaign, led by the National Coast Watch Council.

All agencies involved recognize that better cooperation could help mitigate the capability gap through pooling resources. However, there continue to be coordination challenges and confusion about overlapping roles. The Navy and Coast Guard were separated in 1998 and often find themselves competing for resources. This can lead to

to further facilitate cooperation. This is perceived as a significant step toward defining agency responsibilities in the Philippines' maritime security policy, though it falls short of a full national maritime strategy.

International cooperation around maritime security has also become a focus for the Philippines. The Coast Guard has led initiatives including the Contact Group on maritime crime in the Sulu and Celebes seas, cohosted by the United Nations Office on Drugs and Crime Global Maritime Crime Programme and bringing together maritime security actors from across the region, and it also signed a memorandum of understanding with the Indonesian Maritime Security Agency. A trilateral cooperative agreement among Indonesia, Malaysia and the Philippines — incorporating coordinated patrols in the Sulu and Celebes seas and information sharing — is maturing despite ongoing sovereignty disputes.

As a result of these initiatives, there is increasing, yet still cautious, optimism that despite expected capability gaps in terms of assets, the Philippines will be able to better



a lack of transparency and, sometimes, tension between the agencies.

Recently, there has been promising movement concerning coordination despite these issues, and there is a sense of optimism among the agencies that relations are heading in the right direction. Two developments stand out.

First, the NCWC was implemented in 2015 as a point of contact for maritime security coordination. While the NCWC lacks command potential (compared with Thailand's Maritime Enforcement Coordinating Center, for example), it could enhance interagency coordination by serving as a focal point and knowledge source concerning the Philippines' territorial waters. The NCWC operates an expanding coast watch system, which forms the core of the Philippines' maritime domain awareness.

Second, an interagency protocol has been drafted

achieve maritime security if it continues to strengthen coordination domestically and internationally.

Members of the National Police Maritime Group, NCWC, Navy and Coast Guard have argued that the most important step would be a strategy that clearly identifies the problems and priorities of the Philippines' maritime security and delineates maritime agencies' roles within this. This would help bring forward wider maritime security issues beyond geopolitics. It could also ease obstacles to coordination by demonstrating nodes of common interest, establishing areas of responsibility and offering a clearer basis for action going forward.

Dr. Scott Edwards is a research associate with SafeSeas, a network of researchers who investigate maritime security, ocean governance and crimes at sea. He produced this article following a research visit to the Philippines, where he focused on security practitioners. SafeSeas originally published this article in October 2019. It has been edited to fit FORUM's format.

ASTEROID SAMPLES MORE THAN EXPECTED,

JAPANESE RESEARCHERS SAY

amples of dust collected by a Japanese space probe from an asteroid 300 million kilometers from Earth were better than hoped for, with one researcher saying he was at a loss for words when they opened the capsule.

The samples, the climax of a six-year space odyssey to the Ryugu asteroid by the probe Hayabusa2, arrived in Japan in early December 2020, but researchers did not know whether they had anything until a week later.

"We were aiming for 100 milligrams or more, and we definitely got that," said Hirotaka Sawada at the Japan Aerospace Exploration Agency (JAXA), who said he was speechless when he first glimpsed the sample. "I think that next I probably screamed; I don't really remember," he told a news conference. "It was really different from what I expected. There was a fair amount."



Yuichi Tsuda, a Japan Aerospace Exploration Agency project manager, attends a December 2020 news briefing on the asteroid probe. REUTERS

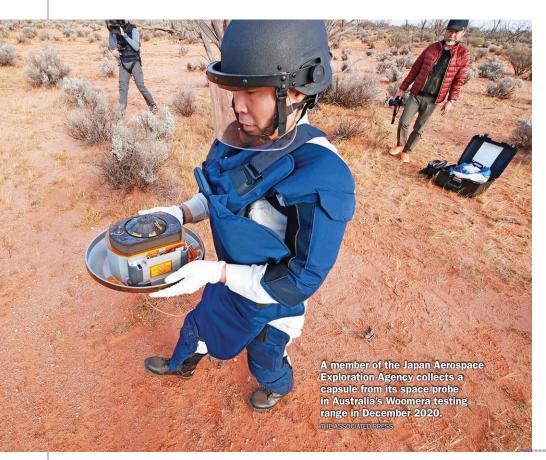
Asteroids are believed to have formed at the dawn of the solar system, and scientists have said the sample may contain organic matter that could have contributed to life on Earth. The Hayabusa2, named for the peregrine falcon,

> orbited Ryugu for a few months before landing, then used small explosives to blast a crater and collected the resulting debris. After dropping off the capsule, it headed back into space.

That capsule plunged to Earth in Australia's Outback on December 6 and was flown to Japan. The final stage of its journey was by truck to a JAXA research center just outside Tokyo, where it was greeted by a crowd of excited researchers.

After removing and preparing the samples, including weighing them to determine how much was obtained, a process that will take some time, the researchers will begin their deeper analysis.

"We're absolutely thrilled," said Sei-ichiro Watanabe, a Nagoya University professor who heads the research team. "There's so many things we should be able to learn from this." Reuters





Republic of Korea (ROK) Honor Guard members participate in the welcome ceremony for U.S. Secretary of Defense Lloyd Austin, hosted by ROK Minister of National Defense Suh Wook, in Seoul on March 17, 2021. During their meeting, the two leaders committed to continuing to strengthen the U.S.-ROK defense relationship.

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