



MAKING WAVES

A maritime news brief covering:

- **MARITIME SECURITY**
- **MARITIME FORCES**
- **SHIPPING, PORTS AND OCEAN ECONOMY**
- **MARINE ENVIRONMENT**
- **GEOPOLITICS**

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MARITIME SECURITY

EIGHT RUSSIAN NAVY SHIPS MAKE READY FOR ICE-FREE NORTHERN SEA ROUTE

- Thomas Nilsen

This is the ninth year in a row that Russian Navy ships sail the Northern Sea Route. Destinations and port-calls are not yet announced, but traditionally the annual flotilla sails all east to Kotelny Island, where Russia has one of its new Arctic bases. Kotelny is part of the New Siberian Islands in the Laptev Sea in the eastern sector of the Northern Sea Route. This year, the voyage will not be challenged by sea-ice. Already by 20th July, there was completely open waters across the Northern Sea Route.

Normally, ice used to pack north of the Taymyr Peninsula, but for the 2020 season ships will find open waters across the vast seaway. Additional to «Severomorsk», the two landing ships «Kondopoga» and «Aleksandr Otrakovsky» will be sailing, as well as the new navy icebreaker «Ilya Muromets», the tanker «Sergey Osipov», the minesweeper «Vladimir Gumanenko» and the rescue tugboat «Pamir». Together with the crane ship KIL-143 all these vessels have this week been training together in the Barents Sea, but are currently back in port in Severomorsk, making ready for the Arctic voyage, the press service of the Northern Fleet reports. Several of the vessels have participated in previous years' voyage where live-shooting exercises, landings, and anti-terror drills at locations like Dudinka and the Kotelny Islands were included.

Source: thebarentsobserver.com; 31 July 2020

US NAVY PREPARES MAJOR SURGE OF LITTORAL COMBAT SHIP DEPLOYMENTS

- David B. Larter

WASHINGTON — The U.S. Navy is taking major steps in an attempt to shake off years of false starts and setbacks with the Littoral Combat Ship program, an effort Chief of Naval Operations Adm. Michael Gilday said he'd oversee on his watch. In an exclusive interview with Defense News on July 16, Gilday listed LCS as a major priority, saying he will turn up the heat on efforts to get the ship to become a major contributor to fleet operations.

“There are things in the near term that I have to deliver, that I'm putting heat on now, and one of them is LCS,” Gilday said. “One part is sustainability and reliability. We know enough about that platform and the problems that we have that plague us with regard to reliability and sustainability, and I need them resolved.”“That requires a

campaign plan to get after it and have it reviewed by me frequently enough so that I can be sighted on it. Those platforms have been around since 2008 — we need to get on with it. We’ve done five deployments since I’ve been on the job, we’re going to ramp that up two-and-a-half times over the next couple of years, but we have got to get after it,” he added. “LCS for me is something, on my watch, I’ve got to get right.” Gilday’s renewed focus on LCS comes after years of fits and starts as the Navy struggled with almost every aspect of the complicated program: from manning and maintaining the hulls, to keeping the gear running or even fielding the sensor suites needed to perform the missions for which they were built. The ship has become a perennial whipping boy for a Congress frustrated by the service’s struggle to field new technologies, such as those built into the LCS or the Ford-class aircraft carrier, conceived in the early 2000s. Two of the technologies the Navy has yet to field are the mine-hunting mission module, intended to replace the service’s aging minesweepers, and the anti-submarine warfare mission module. Both are years overdue, though they have made significant progress. Getting those fielded is among Gilday’s top priorities.

“I have to deliver ... both the mine and ASW modules,” Gilday said. “These ships are probably going to [start going] away in the mid-2030s if the [future frigate] FFG(X) build goes as planned. But I need to wring as much as I can out of those ships as quickly as I can.” The LCS program comprises two hulls: a monohull version built in Marinette, Wisconsin, by Lockheed Martin and Fincantieri; and a trimaran version built by Austal USA in Mobile, Alabama. Congress funded 35 of the ships and has commissioned 20 of them, but deploying the ship has been a challenge because of reliability problems with the complicated propulsion systems designed to meet the Navy’s 40-knot speed requirement. In 2016, the Navy fundamentally reorganized the program, jettisoning the signature modularity of the program where a single LCS would have a small, permanent crew and switch out anti-surface, anti-submarine or mine-warfare mission packages on the pier depending on the mission. Each mission package would then come with a group of specialists to operate the equipment. After a series of accidents, the Navy sought to simplify the concept; semi-permanently assign mission packages to each hull; and change a complicated three-crews-for-two-LCS-hulls model to a blue-and-gold crewing model used in ballistic missile submarines as a way of boosting operational tempo. The reorg was in response to concerns that the rotational crewing model reduced crew ownership of the vessel, potentially contributing to some of the accidents that plagued the program. One of the major accidents wrecked the then-forward-deployed Fort Worth’s combining gear (roughly the same as the clutch on a car) when the crew started up the system without lube oil running. Prior to the Fort Worth accident, the combining gear onboard the Milwaukee encountered problems on the ship’s transit from the shipyard to its home base in Florida and had to be towed into Norfolk, Virginia.

Mission packages

Gilday’s goal of fielding the mission modules is well along already, according to two sources familiar with the progress, who spoke to Defense News on condition of anonymity. The mine-warfare mission module is on track for a final test and evaluation by the end of this year, a source with knowledge of the program told Defense News, and the individual components have already passed testing and are in initial low-rate production. End-to-end testing of the mine-warfare mission module is set to begin in

fiscal 2021 and is on track to have its initial operating capability declared in 2022, another source said. The status of the ASW mission module, which has been a regular target of Congress-imposed budget cuts, is a little less clear. The next major milestones for the ASW mission package will likely slip to next year due to budget cuts, a source with knowledge of the program said. The mission module has been integrated into the LCS Fort Worth and testing began last fall. It's unclear if the testing will be delayed or interrupted if the Navy is able to carry through its plan to decommission the first four littoral combat ships. For the Independence variant — the trimaran hull — testing for the ASW mission module is slated to be installed on the LCS Kansas City, but there is no fixed date yet, according to a Navy official.

Missions

Aside from the issues with a buggy propulsion train and the delayed mission modules, Gilday said he was happy with where LCS is with regard to manning, and said the blue-gold crewing was giving him a lot of availability to play with. "I do think we have it about right with manning," Gilday said. "We were honest with ourselves that the original design wasn't going to do it. I really like the blue-and-gold construct because I get way more [operational availability] than I would with just the single crew. "So I can get these ships out there in numbers doing the low-end stuff in, let's say, 4th Fleet where I wouldn't need a DDG."

The Navy deployed the LCS Detroit to South America — the 4th Fleet area of operations — last year on a counternarcotics mission, and it returned earlier this month. Those are the kinds of missions for which the LCS is perfectly suited, Gilday said. "I can deploy these things with a [law enforcement detachment] and a signals intelligence capability, and I can do that on LCS with carry-on gear," Gilday said. "It's the right kind of platform for that. Also in 5th Fleet, those maritime security missions that we were heavily sighted on in the late 1990s and early 2000s: They still exist, I'd just prefer to do them with an LCS instead of a DDG if I can." But without getting more reliability out of the propulsion system, even the low-end missions the Navy wants of the LCS will be a challenge. The heart of the issue seems to lie with long ocean transits, such as the one from San Diego, California, to Singapore, where the ships are supposed to be forward based. Cutting back on that transit, and the wear it puts on the ship, should be core to the Navy's strategy to getting more from LCS, said Bryan Clark, a retired submarine officer and senior fellow at the Hudson Institute.

"The propulsion architecture's unreliability means you are going to have to come up with a different way to deploy the ship that doesn't require every deployment to be transoceanic," Clark said. "By the time the ship gets to Singapore, it needs a lot of work done to it and your deployment time is cut down by the fact that you have to repair the ship once it arrives. Then it has to return to the U.S. So both those trips are so fraught that the Navy ends up devoting a lot of time and resources to it." One alternative would be to forward-station the ships for a longer period of time than the 16-24 months the Navy envisioned, and place them in Sasebo, Japan, rather than Singapore, Clark said. Sasebo has always been in the cards for LCS as a home for the mine-warfare LCS hulls. When it comes to the delays on the mission modules, Clark said, the Navy should consider fielding those capabilities in the mine-warfare mission module that are already workable, or consider an alternate structure based on the model used by the Explosive Ordnance Disposal technicians. "The other thing they need to do is come up

with a way for the mine-warfare capabilities to the degree they are available. And come up with the concept of operations for that, meaning the warfare folks in San Diego would need to come up with concepts for the equipment they do have rather than what they want to have,” he said. As for the ASW mission module, that might be something the Navy will want to revisit, he added.

“They need to decide if the ASW mission package is going to be part of LCS,” Clark explained. “The ASW module is the module with the most proven capability in it and is the one that would offer the best improvement in LCS contribution to the fleet. “But it’s also the most expensive. And if LCS is not deploying, then why spend the money on it? And with the frigate coming along, it’s going to be doing the same missions with the same kind of systems, so why invest in the LCS version?” What is clear is that leadership from the upper echelons of the Navy should help move things along, Clark said. “It’s good to hear Gilday is taking it on,” he noted. “But I think part of that is going to be accepting that we’re never going to get where we wanted to be on LCS, and accepting second best is probably the best way to get the most from LCS. “You’ll have to say: ‘We accept the fact that we’re not going to have a full mine-warfare mission module. We accept that we’ll have to deploy them forward and eliminate these long transits and ASW is probably out the window.’ So it is about making hard choices like that and taking the heat.”

Source: defensenews.com; 01 August 2020

ROYAL NAVY CREATES STIR BY ASKING IRISH TRAWLER TO MOVE IN IRISH EEZ

The Royal Navy frigate HMS Lancaster created a diplomatic stir last week when she allegedly asked an Irish fishing vessel to cease fishing within the Irish EEZ due to an ongoing submarine exercise. The fishing vessel, the Marliona, reported that it received a call from HMS Lancaster instructing her to cease fishing and depart the scene. The Lancaster was reportedly operating with a sub and planned to continue its exercise for a three-day period. "I have been involved in the fishing industry for 40 years and have never seen this happen before. For the UK vessel to radio a trawler and tell him to get out of the area is totally unacceptable," said Sean O'Donoghue, the head of the Killybegs Fisheries Organisation, in an interview with Independent.ie.

In response, two Irish Navy ships were placed on standby and an Irish maritime patrol aircraft was dispatched to monitor the area. As for the Marliona, she resumed fishing in the same area off the coast of Tory Island. Though the alleged incident occurred 60 nm from shore - well outside of Ireland's territorial seas - some Irish political leaders described it as a violation of their nation's sovereignty, as the trawler was pursuing an Irish-administered fishing quota within Ireland's exclusive economic zone. "The disregard for Irish sovereignty is arrogance of the highest order . . . For decades, British submarines have infringed on Irish sovereign waters, leading to tragedy and loss of life when submarines have got caught up in fishing nets and pulled trawlers under," said the Sinn Fein party's foreign affairs spokesperson, John Brady. "It is staggering and

unacceptable that this flagrant disregard for the safety of Irish fishing crews is continuing."

The Royal Navy has confirmed that HMS Lancaster broadcast a warning to shipping via VHF, notifying vessels in the area of the presence of the submarine. It told UK outlet The News that Lancaster was operating within the bounds of UNCLOS and that there was no risk to safety for any of the vessels involved. The Royal Navy's submarines have been involved in several near-miss incidents and fatal casualties off Ireland and the UK over the years. In November 2018, the ferry Superfast VII passed close by an unnamed Royal Navy sub operating at periscope depth on a run between Belfast and Scotland. In 2015, an unnamed Royal Navy sub snagged the nets of the Northern Ireland-registered trawler Karen, dragging it stern-first at seven knots and nearly pulling it under. The skipper knew that it was a sub strike and cut most of the net away, saving his vessel. The sub's crew was not aware that something had gone wrong until three hours later, according to the UK Marine Accident Investigation Branch.

Source: maritime-executive.com; 29 July 2020

MIKE POMPEO SAYS QUAD WITH AUSTRALIA, INDIA, JAPAN 'REINVIGORATED'; CALLS FOR SETTLING SOUTH CHINA SEA DISPUTE

- Jonathan Marcus

Washington: US Secretary of State Mike Pompeo, on Friday said that 'our quad' – the United States, Australia, India, and Japan has been reinvigorated and added that momentum is building to mitigate the threats of the Chinese Communist Party. "Our diplomatic efforts are working, & momentum is building to mitigate the threats that the Chinese Communist Party presents. All 10 ASEAN nations have insisted that the South China Sea disputes must be settled on basis of international law, including UNCLOS," Pompeo said. On Thursday, while inaugurating the Supreme Court complex of Mauritius, Prime Minister Narendra Modi also batted for security in the Indian Ocean Region (IOR). In an indirect reference to China, Modi said that in the name of development partnerships, nations were forced into dependence partnerships.

"For India, the most fundamental principle in development cooperation is respecting our partners. This sharing of development lessons is our only motivation. That is why our development cooperation does not come with any conditions," he said. The dispute in the South China Sea pertains to Chinese claims over islands in that region. China's expansionist designs have also affected India along the Line of Actual Control (LAC) in Eastern Ladakh. Last month, 20 Indian soldiers were martyred even as Chinese PLA troops suffered heavy casualty when a violent clash broke out between Indian and Chinese troops in the Galwan area in Eastern Ladakh.

Trump continues his attack on China

Meanwhile, continuing his relentless attack on China for COVID-19, US President Donald Trump, on Friday said that Beijing should have stopped the spread of coronavirus. "We can never ever forget the people whom we have lost. We will never forget what happened. This could have been stopped in China, they should have stopped it and they didn't," Trump said.

Source: [bbc.com](https://www.bbc.com); 23 July 2020

US WARPLANE APPROACHES SHANGHAI AS TENSIONS REMAIN HIGH AMID CONSULATE CLOSURES

- Lawrence Chung

US warplanes have again approached the Chinese mainland, including one that came less than 100km away from Shanghai, as tensions between the two countries continue to rise with the tit-for-tat closures of consulates. A P-8A anti-submarine plane and an EP-3E reconnaissance plane entered the Taiwan Strait, flying near the coast of Zhejiang and Fujian on Sunday, according to the South China Sea Strategic Situation Probing Initiative, a Peking University think tank. It first tweeted about the operation on Sunday morning, later adding that the reconnaissance plane was flying back "after approaching Fujian" and "the southern part of the Taiwan Strait". The think tank tweeted again at night, saying the US Navy P-8A was operating near Shanghai, with the USS Rafael Peralta, a guided missile destroyer, following a similar route, asking "might be a joint operation?".

According to a chart from the think tank, the P-8A came within 76.5km (47.5 miles) of Shanghai, the closest any US planes have come to mainland China in recent years, while the other plane came within 106km of Fujian's southern coast. It was the 12th day in a row that US military planes have approached the mainland coast. On Monday the institute tweeted that "it seems" a US air force RC-135W – another reconnaissance plane – had entered Taiwan's airspace and asked if anyone could confirm it. The Taiwanese defence ministry declined to comment on the claims. But in the late afternoon, the institute tweeted again, saying a EP-3E was conducting close-in reconnaissance of Guangdong less than 100km from the coast. The P-8A's approach to Shanghai came after Beijing had ordered the US consulate in Chengdu to close by 10am on Monday in response to the closure of its consulate in Houston last week. The closures were the latest in a series of confrontations ranging from areas such as trade and technology to diplomacy and the South China Sea.

On Thursday, the South China Sea Strategic Situation Probing Initiative released a scratchy audio recording of what appeared to be a warning from the Chinese navy to a US military plane to change course or be intercepted. The think tank said the audio had been captured by a radio amateur that morning. It remains unclear which aircraft was involved but it was said to be flying close to the southern Chinese coast, north of the Taiwan Strait. It is unknown whether any subsequent aerial encounter took place. The closures were the latest in a series of confrontations ranging from areas such as

trade and technology to diplomacy and the South China Sea. On Thursday, the South China Sea Strategic Situation Probing Initiative released a scratchy audio recording of what appeared to be a warning from the Chinese navy to a US military plane to change course or be intercepted. The think tank said the audio had been captured by a radio amateur that morning. It remains unclear which aircraft was involved but it was said to be flying close to the southern Chinese coast, north of the Taiwan Strait. It is unknown whether any subsequent aerial encounter took place. According to the think tank, US air force E-8C surveillance planes have come within 185km or less of the southeast coast of Guangdong province on four separate occasions in the past week.

“At the moment the US military is sending three to five reconnaissance aircraft each day to the South China Sea,” the think tank said, adding the US military planes have come unusually close to mainland airspace several times since April. “In the first half of 2020 – with much higher frequency, closer distance and more variety of missions – the US aerial reconnaissance in the South China Sea has entered a new phase.” According to its statistics, US planes made a record 50 sorties over the South China Sea in the first three weeks of July – a time when both countries’ armed forces were conducting training exercises. The project’s director Hu Bo said the frequent encounters between US and Chinese ships and planes raised the risk of a clashes, although he said the chance of this escalating into a large-scale conflict was small. In 2001 a US navy signals intelligence aircraft collided in mid-air with a Chinese interceptor near Hainan province, killing a Chinese pilot.

The 24 American crew members were detained and interrogated by the mainland authorities until the US government issued an ambiguously worded statement that helped defuse tensions. “Although the US has been trying to decouple with China in other areas, they are still closely connected,” Hu said. “So the chance of a large-scale conflict happening is small. But a medium or small-scale conflict is possible, such as two warships hitting each other or occasional crossfire, since the two countries’ warships and aircraft encounter each other every day.” Chinese state media has reported that aviation units from a navy brigade are currently undertaking live-fire drills in the South China Sea while a nine-day exercise is also being held off the Leizhou peninsula in Guangdong.

Source: scmp.com; 27 July 2020

MARITIME FORCES

US NAVY BEGINS DESIGN EVALUATION FOR NEW SUB-TRACKING SHIPS

- Steven Stashwick

A U.S. shipyard is proceeding with initial studies and design evaluation for a new generation of advanced ocean surveillance vessels for detecting and tracking submarines, with the first ship to be delivered in 2025. The yard also built the U.S. Navy's last ocean surveillance ship, the USNS Impeccable, which was threatened and harassed by Chinese planes, ships, and paramilitary militia vessels in a high-profile South China Sea incident 2009. The existing unarmed research vessels make an outsized contribution to the U.S. Navy's anti-submarine capabilities. By trailing sensitive listening equipment on miles-long cables behind them called the Surface Towed Array Sensor System (SURTASS), the vessels are able to detect and then help track submarines from great distances, and then provide that data to other ships, planes, or submarines. Their unusual catamaran design provides stability in rough seas and reduces the sound transmitted into the water by the ship's machinery.

The U.S. Navy's small fleet of five ocean surveillance ships will begin to reach the end of their service lives in 2025, when the first of the new generation is expected to be delivered. The Navy may ultimately buy six or seven of the new vessels, underscoring their importance to maintaining the United State's undersea edge in the Western Pacific. Former Pacific Command chief Admiral Harry Harris described the U.S. Navy's undersea superiority as its most important asymmetric military advantage over China in the region. Earlier this year China deployed two additional Type 094 ballistic missile submarines, bringing its fleet of nuclear deterrent submarines to six. Sea-based nuclear deterrents are generally considered to be the most secure, compared to land-based missiles or bombs delivered by aircraft, which might be more easily targeted. China is designing an advanced new nuclear-tipped ballistic missile believed to be for its next-generation ballistic missile submarines, the Type 096, which are under development. The new JL-3 missile may have a range of 12,000 kilometers, which would enable to target most of the United States from off China's coast. South China Morning Post reports that the new Type 096 submarine armed with JL-3 missiles might be ready by 2025, the same year that the U.S. Navy's new surveillance ships are expected to begin to be delivered. Recognizing the advantages that advanced undersea detection capabilities provide, China has been working to develop its own fleet of ocean surveillance vessels in recent years. China may now have at least three such surveillance vessels.

Concerned by China's growing assertiveness and potential threat, Japan has also sought to improve its undersea surveillance capabilities. As recently as June 2020,

Japan detected a likely Chinese submarine in its contiguous waters around the Ryukyu Islands. In 2018 a Chinese submarine ignored repeated warnings while sailing in the vicinity of the Japanese-administered Senkaku Islands, which China claims as its own and calls the Diaoyu Islands. In response to these and similar incidents, in March Japan launched its first new ocean surveillance ship in almost 30 years in a sign of its concern over China's growing submarine fleet. Japan now has a fleet of three advanced sub-tracking ships. The Japanese vessels also carry SURTASS, making Japan's the only foreign navy equipped with the sensitive U.S.-built technology.

Source: thediplomat.com; 31 July 2020

AL DHAFRA, AL-UDEID GO ON TEMPORARY ALERT DURING IRANIAN 'ATTACK' ON MOCK NIMITZ-CLASS CARRIER

- Jon Gambrell, The Associated Press

DUBAI, United Arab Emirates (AP) — Iran's paramilitary Revolutionary Guard launched missiles Tuesday targeting a mock aircraft carrier in the strategic Strait of Hormuz, a drill that included such a barrage of fire the U.S. military temporarily put two regional bases in the Mideast on alert amid tensions between the two countries. The drill — and the American response to it — underlined the lingering threat of military conflict between Iran and the U.S. after a series of escalating incidents last year led to an American drone strike killing a top Iranian general in Baghdad. Tehran responded to that strike by firing ballistic missiles that wounded dozens of American forces in Iraq.

While the coronavirus pandemic has engulfed both Iran and the U.S. for months, there has been a growing confrontation as America argues to extend a yearslong U.N. weapons embargo on Tehran that is due to expire in October. A recent incident over Syria involving an American jet fighter approaching an Iranian passenger plane also has renewed tensions. Iranian commandos fast-roped down from a helicopter onto the replica in the footage aired Tuesday from the exercise called "Great Prophet 14." Anti-aircraft guns opened fire on a target drone near the port city of Bandar Abbas.

State television footage also showed a variety of missiles being fired from fast boats, trucks, mobile launchers and a helicopter, some targeting the fake carrier. A commander said the Guard, a force answerable only to Supreme Leader Ayatollah Ali Khamenei, planned to fire "long-range ballistic missiles" as well during the drill that will continue Wednesday. Ballistic missile fire detected from the drill resulted in American troops being put on alert at Al-Dhafra Air Base in Abu Dhabi in the United Arab Emirates and Al-Udeid Air Base, the forward headquarters of the U.S. military's Central Command in Qatar, the military said. Troops sought cover during that time. "The incident lasted for a matter of minutes and an all clear was declared after the threat ... had passed," said U.S. Army Maj. Beth Riordan, a Central Command

spokeswoman. Both bases are hundreds of kilometers (miles) away from where Iran put the replica aircraft carrier. Al-Dhafra also is temporarily home to five French-built Rafale fighter jets on their way to India for that country's air force. Other footage from the exercise aired by state television showed fast boats encircling the mock-up, kicking up white waves in their wake. While Iran's naval forces are dwarfed by the U.S. Navy, its commanders practice so-called "swarm" tactics aimed at overwhelming the U.S. carriers that pass through the strait on their way in and out of the Persian Gulf.

It wasn't immediately clear if all the footage was from Tuesday, as one overhead surveillance image that appeared to be shot by a drone bore Monday's date. The exercise had been expected as satellite photos released Monday showed the fake carrier being moved into place by a tugboat. A black-and-white satellite photo taken Tuesday by Colorado-based firm Maxar Technologies showed damage to the replica's bow and several of its fake jet fighters.

"Our policies to protect the vital interests of the dear nation of Iran are defensive, in the sense that we will not invade any country from the beginning, but we are completely aggressive in tactics and operations," Gen. Hossein Salami, the head of the Guard, was quoted as saying. "What was shown today at this exercise at the level of aerospace and naval forces was all offensive." State TV footage also showed Guard scuba forces underwater, followed by a cutaway to a blast hole just above the waterline on the replica carrier. That appeared to be a not-so-subtle reminder of U.S. accusations last year that Iran planted limpet mines on passing oil tankers near the strait, which exploded on the vessels in the same area. Iran has repeatedly denied the actions, though footage captured by the American military showed Guard members remove an unexploded mine from one vessel. The replica used in the drill resembles the Nimitz-class carriers that the U.S. Navy routinely sails into the Persian Gulf from the Strait of Hormuz, the narrow mouth of the waterway through which 20 percent of all oil traded in the world passes. The aircraft carrier Nimitz, the namesake of the class, just entered Mideast waters late last week from the Indian Ocean, likely to replace the aircraft carrier Dwight D. Eisenhower in the Arabian Sea.

It remains unclear when or if the Nimitz will pass through the Strait of Hormuz or not during its time in the Mideast. The aircraft carrier Abraham Lincoln, deployed last year as tensions initially spiked, spent months in the Arabian Sea before heading through the strait. The Eisenhower came through the strait early last week. To Iran, which shares the strait with Oman, the American naval presence is akin to Iranian forces sailing into the Gulf of Mexico near the coast of Florida. But the U.S. Navy stresses the strait is an international waterway crucial to global shipping and energy supplies. Even as America now relies less on Mideast oil, a major disruption in the region could see prices rapidly rise. Cmdr. Rebecca Rebarich, a spokeswoman for the U.S. Navy's Bahrain-based 5th Fleet that patrols the Mideast, said officials were aware of an Iranian exercise she described as "attempting to intimidate and coerce." "While we are always watchful of this type of irresponsible and reckless behavior by Iran in the vicinity of busy international waterways, this exercise has not disrupted coalition operations in the area nor had any impacts to the free flow of commerce in the Strait of Hormuz and surrounding waters," Rebarich said.

Associated Press journalists Amir Vahdat and Mohammad Nasiri in Tehran, Iran, contributed to this report.

Source: militarytimes.com; 01 August 2020

THALES' RADAR TO DETECT STEALTH TARGETS, DRONE SWARMS ENTERS PRODUCTION

Shishir Gupta

The first 'Ground Fire' radar is now in production at the Thales Limours site in Essonne to equip, among others, the French Air Force's New Generation Medium Range Surface-to-Air System (SAMP/T NG). Designed to simultaneously detect and track a wide range of stealth targets, drone swarms and to prevent coordinated saturation attacks, the Ground Fire has an air defence missile guidance capability to intercept high-maneuvering or ballistic targets. Highly mobile, tactical and air transportable, the radar can be deployed in less than 15 minutes, a major advantage in the theaters of operation. It delivers unmatched performance and mobility with 360° coverage in azimuth, up to 90° in elevation, and a 400km range.

This fully digital multifunction radar, equipped with advanced anti-air and anti-missile capabilities, is capable of countering a wide range of threats, including ballistic missiles. Multi-mission, it can be used in various contexts, such as air defence, air surveillance, counter-battery or trajectory. Ordered in 2019 by the French Procurement Agency, the radar draws on years of engineering and manufacturing development for the Sea Fire, the naval version of the radar selected to equip the Defence and Intervention Frigates of the French Navy.

Source: hindustantimes.com; 25 July 2020

CHINA'S FIRST TYPE-075 ASSAULT CARRIER IS STARTING SEA TRIALS

- H I Sutton

The vessel, which was built in Shanghai, has been fitting out since it was floated on September 26 2019. Candid photos surfacing on the Chinese internet show it being fueled, and tugs readied.

The Type-075 represents a step-change in Chinese Navy (PLAN) amphibious warfare capabilities. It will enable better over-the-horizon landing capabilities and improve air cover. And there are already rumors of the follow-on Type-076 LHD which is expected to include EMALS (Electromagnetic Aircraft Launch System) for UCAVs or crewed

aircraft. At this stage these rumors should be treated with caution. But they do give an indication of the direction PLAN amphibious capabilities are going. In addition to the well-deck for Type 726 hovercraft (generally equivalent to the US Navy's LCAC – Landing Craft Air Cushion), the LHD will have a large rotor-wing component. This will include the ubiquitous Z-8 transport helicopter which is based on the French SA 321 Super Frelon. More modern types seen aboard, in mock-up form, include the naval variant of the Harbin Z-20. This is, in our opinion, a copy of the Sikorsky S-70 Black Hawk / Sea Hawk family. There are also small rotor-wing UAVs and even a Ka-27/28 HELIX anti-submarine warfare helicopter model aboard for deck tests. The carrier suffered a fire incident on April 11 2020. Although the fire was quickly put out and damage appeared minimal, smoke stains are still visible in the aft port-side near to the ramp.

The Hudong-Zhonghua yard in Shanghai where the lead Type-075 has been built has already launched a second ship. And analysis of commercial satellite imagery suggests that module for a third may be on its way. At the moment the yard is building the Type-054A frigate for the Pakistan Navy and, it appears, a Type-071 LPD for Thailand.

Source: navalnews.com; 28 July 2020

NAVY KEEN ON 3RD AIRCRAFT CARRIER TO RETAIN EDGE OVER CHINA, EVEN AS 2ND DELAYED YET AGAIN

NEW DELHI: The commissioning of India's second aircraft carrier has been delayed till September next year because of the COVID-19 pandemic. While reconciling to this setback, the Navy remains all the more keen to push its case for a third aircraft carrier as well as two new fighter squadrons to counter China's expanding footprint in the Indian Ocean Region (IOR).

As the US recently displayed in the South China Sea, much to China's discomfort, nothing projects raw combat power like an aircraft carrier strike group (CSG) capable of moving over 500 nautical miles (900 km) in a single day. But India, which has currently deployed the bulk of its warships and submarines in the IOR to send a clear signal to Beijing, is in danger of losing its decisive edge over China in the CSG arena. Sources say the "basin trials" of the first indigenous aircraft carrier (IAC-I) being built at the Cochin Shipyard, which would have checked the 40,000-ton warship's propulsion, transmission and shafting systems, have been derailed by the pandemic. The basin trials of IAC-I, first sanctioned by the government way back in January 2003, are to be followed by extensive sea trials. It's only after IAC-I gets commissioned in September 2021 now, and is christened INS Vikrant, that the "flight trials" will be launched to make the carrier fully operational by 2022-2023.

The continuing delay in IAC-I, being constructed for Rs 22,590 crore, comes when China already has two aircraft carriers, while two more are being frenetically constructed. With the eventual aim to have a 10-carrier Navy by 2050, China is expected to begin deploying a CSG in the IOR within the next few years to take care of

its “Malacca Dilemma”. India is currently making do with only the 44,500-ton INS Vikramaditya, the refurbished Admiral Gorshkov inducted from Russia for \$2.33 billion in November 2013. Another \$2 billion was spent on procuring 45 MiG-29Ks to operate from its deck.

Sources said Navy will once again push for grant of “acceptance of necessity (AoN)” for a third carrier, the 65,000-tonne IAC-II (tentatively christened INS Vishal), which has been pending since May 2015. Having earlier junked nuclear-propulsion for IAC-II to bring down the price, the Navy contends the projected Rs. 45,000 crore construction cost will be spread over 10-14 years, with the bulk of it being ploughed back into the country’s economy, as was earlier reported by TOI. The proposal may well sail through this time, with the government fast-tracking some long-pending defence projects due to the military confrontation with China.

Similarly, the Navy has also cut down its requirement of 57 multi-role fighters capable of operating from carriers to about 36 (two squadrons) now. With the indigenous twin-engine naval fighter likely to be ready only by 2032, the French Rafale, American F/A-18, Swedish Gripen and Russian MiG-29K would be the contenders for this mega deal. Unlike China, India has mastered the intricate art of operating “flat-tops” over six decades, commissioning as it did its first carrier INS Vikrant with its Sea Hawk jets way back in 1961. It must not lose that edge now.

Source: indiandefenseneews.in; 29 July 2020

CHINA SHIPBUILDING GROUP PLANS TO BUILD AMPHIBIOUS ASSAULT SHIP

China Shipbuilding Group is planning to build an advanced amphibious assault ship to boost the Chinese marines’ ability to hit targets on land and at sea. According to a report of South China Morning Post, the new Type 076 warfare ships are expected to be similar in design to the Type 075 vessel, but will feature an electromagnetic catapult launch system.

This launch system will be used on the currently under-construction next generation Type 002 advanced aircraft carrier vessel. China expects to launch the first Type 002 aircraft carrier in 2021. The upgraded design of a more powerful proposed assault ship will mean that it will be able to accommodate up to 30 helicopters, rotor-wing drones, hovercraft, amphibious tanks, armoured vehicles, boats, hundreds of marine troops for land attacks, and follow-up operations on the ground. Once in service, the vessel will enhance the country’s ability to attack ships and land-based targets from the high seas. Contractor China Shipbuilding Group is yet to receive approvals for the plan from the government. Work on the new assault vessel is expected to take at least five years.

The proposed vessel is likely to have a displacement of about 40,000t. This vessel will be the world’s third largest amphibious assault ship after US Wasp-class and America class vessels, and the country’s first. China has been strengthening its military in recent years and has launched five amphibious assault ships since 2016. The country launched its second Type 075 LHD in April, but these vessels are yet to enter service.

Naval commentator Li Jie was quoted by the Hong Kong-based publication as saying that there were technological challenges in integrating electromagnetic catapult technology with Type 075 design. Jie said: “Only when the new Type 002 aircraft carrier finishes testing the three electromagnetic catapult can we make sure it’s a mature technology that could be applied on the flight deck of the Type 075. “Indeed, the full development of the Type 076 will only be finalised when China successfully develops the first stealth carrier-based fighter jet, as well as other variants of stealth drones.”

Source: navaltechnology.com; 28 July 2020

SHIPPING, PORTS AND OCEAN ECONOMY

ABOARD THE DIAMOND PRINCESS, A CASE STUDY IN AEROSOL TRANSMISSION

- Benedict Carey and James Glanz

In a year of endless viral outbreaks, the details of the Diamond Princess tragedy seem like ancient history. On Jan. 20, one infected passenger boarded the cruise ship; a month later, more than 700 of the 3,711 passengers and crew members had tested positive, with many falling seriously ill. The invader moved as swiftly and invisibly as the perpetrators on Agatha Christie's Orient Express, leaving doctors and health officials with only fragmentary evidence to sift through. Ever since, scientists have tried to pin down exactly how the coronavirus spread throughout the ship. And for good reason: The Diamond Princess' outbreak remains perhaps the most valuable case study available of coronavirus transmission — an experiment-in-a-bottle, rich in data, as well as a dark warning for what was to come in much of the world.

Now, researchers are beginning to use macroscopic tools — computer models, which have revealed patterns in the virus's global spread — to clarify the much smaller-scale questions that currently dominate public discussions of safety: How, exactly, does the virus move through a community, a building or a small group of people? Which modes of transmission should concern us most, and how might we stop them? In a new report, a research team based at Harvard and the Illinois Institute of Technology has tried to tease out the ways in which the virus passed from person to person in the staterooms, corridors and common areas of the Diamond Princess. It found that the virus spread most readily in microscopic droplets that were light enough to float in the air, for several minutes or much longer. The new findings add to an escalating debate among doctors, scientists and health officials about the primary routes of coronavirus transmission. Earlier this month, after pressure from more than 200 scientists, the World Health Organization acknowledged that the virus could linger in the air indoors, potentially causing new infections. Previously, it had emphasized only large droplets, as from coughing, and infected surfaces as the primary drivers of transmission. Many clinicians and epidemiologists continue to argue that these routes are central to disease progression. The new paper has been posted on a preprint server and submitted to a journal; it has not yet been peer-reviewed, but it was shown by Times reporters to nearly a dozen experts in aerosols and infectious disease. The new findings, if confirmed, would have major implications for making indoor spaces safer and choosing among a panoply of personal protective gear.

For example, ventilation systems that “turn over” or replace the air in a room or building as often as possible, preferably drawing on external air to do so, should make indoor spaces healthier. But good ventilation is not enough; the Diamond Princess was well ventilated and the air did not recirculate, the researchers noted. So wearing good-quality masks — standard surgical masks, or cloth masks with multiple layers rather than just one — will most likely be needed as well, even in well-ventilated spaces where people are keeping their distance. The computer modeling adds a new dimension of support to an accumulating body of evidence implicating small, airborne droplets in multiple outbreaks, including at a Chinese restaurant, a choir in Washington State, as well as a recent study at a Nebraska hospital to which 13 passengers from the Diamond Princess had been evacuated. One researcher not involved in the new work, Julian Tang, an honorary associate professor of respiratory sciences at the University of Leicester in the United Kingdom, said the paper was “the first attempt, as far as I know, to formally compare the different routes of coronavirus transmission, especially of short versus long-range aerosols.” He characterized the distances and the kinds of particles involved with a simple analogy from everyday life: “If you can smell what I had for lunch, you’re getting my air, and you can be getting virus particles as well.” Another researcher, Linsey Marr, a professor of civil and environmental engineering at Virginia Tech who studies airborne transmission of viruses, had a more vivid description of the finding: the “garlic breath” effect. “As you’re close to someone, you smell that garlic breath,” Dr. Marr said. “As you’re farther away, you don’t smell it.” The “garlic breath” effect would suggest that powerful ventilation in buildings — primarily using outside air, or very well filtered — could reduce the transmission of the virus. The study found that small particles also had some ability to spread it at longer distances, presumably beyond the range of breath odor.

From the start of the pandemic, scientists have grappled with the mechanisms of coronavirus spread. Early on, surface transmission was widely emphasized; larger droplets, which travel on more ballistic trajectories, like a stone through the air, and strike mucus membranes directly, are now favored by a number of researchers. Other possibilities are candidates as well, said Dr. John Conly, an infectious disease physician and infection control expert with the University of Calgary in Canada who has done consulting with the World Health Organization. “We’re getting surprises all the way along,” Dr. Conly said. “This paper I find interesting, but it has a long way to go to be able to get into a line of credibility, in my mind.” Dr. George Rutherford, a professor of epidemiology at the University of California, San Francisco, was equally skeptical. He said that, outside of hospital settings, “large droplets in my mind account for the vast majority of cases. Aerosols transmission — if you really run with that, it creates lots of dissonance. Are there situations where it could occur? Yeah maybe, but it’s a tiny amount.” Dr. Tang and other scientists strongly disagree. “If I’m talking to an infectious person for 15 or 20 minutes and inhaling some of their air,” Dr. Tang said, “isn’t that a much simpler way to explain transmission than touching an infected surface and touching your eyes? When you’re talking about an outbreak, like at a restaurant, that latter seems like a torturous way to explain transmission.” In the new analysis, a team led by Parham Azimi, an indoor-air researcher at Harvard’s T.H. Chan School of Public Health, studied the outbreak on the Diamond Princess, where physical spaces and infections were well documented. It ran more than 20,000 simulations of how the virus might have spread throughout the ship. Each simulation

made a variety of assumptions, about factors like patterns of social interaction — how much time people spent in their cabins, on deck or in the cafeteria, on average — and the amount of time the virus can live on surfaces. Each also factored in varying contributions of smaller, floating droplets, broadly defined as 10 microns or smaller; and larger droplets, which fall more quickly and infect surfaces or other people, by landing on their eyes, mouth or nose, say.

About 130 of those simulations reproduced, to some extent, what actually happened on the Diamond Princess as the outbreak progressed. By analyzing these most “realistic” scenarios, the research team calculated the most likely contributions of each route of transmission. The researchers concluded that the smaller droplets predominated, and accounted for about 60 percent of new infections over all, both at close range, within a few yards of an infectious person, and at greater distances. “Many people have argued that airborne transmission is happening, but no one had numbers for it,” Dr. Azimi said. “What is the contribution from these small droplets — is it 5 percent, or 90 percent? In this paper, we provide the first real estimates for what that number could be, at least in the case of this cruise ship.” The logic behind such transmission is straightforward, experts said. When a person is speaking, he or she emits a cloud of droplets, the vast majority of which are small enough to remain suspended in the air for a few minutes or longer. Through inhalation, that cloud of small droplets is more likely to reach a mucus membrane than larger ones soaring ballistically. The smaller droplets are also more likely to penetrate deeply into the respiratory system, down to the lungs. It may take a much smaller viral load — fewer viruses — to cause infection in the lungs than higher up, such as in the throat. This, at least, is the case for other respiratory viruses, like the flu.

Brent Stephens, an engineering professor at the Illinois Institute of Technology in Chicago and a co-author on the paper, said the findings were important in shaping, for example, measures that should be taken as college students return to campus. The first, he said, should be “really enforcing mask policies.” Another, he said, is to recognize that there is a “huge variability in mask quality,” and material that actually stops small aerosols when someone is breathing, speaking, coughing or sneezing is crucial. Surgical masks are good, he said, but single-ply fabrics often are not. As various transmission routes come into clearer focus, they will provide specific guidelines on how to reopen schools, offices, restaurants and other businesses. “The value of this model is that it allows for recommendations and guidance to be specific to each unique environment,” said another co-author, Joseph G. Allen, an expert in indoor air quality and an assistant professor at Harvard’s T.H. Chan School of Public Health. Dr. Allen said those environments ranged from restaurants to dentist offices. In each case, he said, there are low-cost solutions that sharply improve ventilation and filtration — most buildings fall well short of optimal levels — and in turn reduce the risks of airborne infection. “To me, this is an all-in moment,” Dr. Allen said. “We need better ventilation and better filtration, across the board, in all our buildings.”

Source: [nytimes.com](https://www.nytimes.com); 30 July 2020

PORT OF ROTTERDAM EXPECTS CAUTIOUS RECOVERY IN H2, FOCUS ON SUPPLY CHAIN SECURITY

- Marchus Hand

The Port of Rotterdam is cautiously optimistic on volume growth in the second half of the year and expects security of the supply chain will be more important as a result of the Covid-19 pandemic. The Port of Rotterdam reported a 9.1% drop in cargo throughput to 218.9m tonnes in the first half of the year a number that Emile Hoogsteden, director of commerce of the Port of Rotterdam Authority said was “not that bad”.

Speaking to an online media briefing Hoogsteden explained: “If you had told me a year ago that by this time we’d have to announce a 9% decline in throughput I would have had a heart attack, but at this point in time, everything is relative, ‘it’s at least not as bad as we thought it would be’. The throughput volumes in the second quarter turned out to be better than we expected.” Looking specifically at the container sector he noted that in terms of tonnes there was only a 3.3% drop in the first of 2020 compared to the same period a year earlier. This was 7% in teu terms but that was due to less empty containers returning to China. “Towards the end of the second quarter we saw volumes stabilise and increase a bit, so that was good to see,” Hoogsteden said. There has been an improvement in the balance of imports and exports. “Exports from the Netherlands to China have been growing at 12.5% which is remarkable. As we see from port of Rotterdam export of full containers has grown by 13.5% over the last six months,” Hoogsteden explained. Exports from Rotterdam to China that have increased include pork, medicine, machinery, milk powder and timber.

Coming to the second half of the year he said: “If we look ahead of us and the remainder of the year we expect a cautious recovery. Of course there’s a great uncertainty surrounding that positive outlook. We feel here still and optimism, you see the procurement indexes picking up again. “We’ve seen a huge drop in volumes April, May, beginning of June. It’s picking up from the deep end, we see volumes coming back slowly but surely.” With the Covid-19 pandemic severely impacting the supply chain from China and in many other parts of the world in the first half the year there has been a lot of talk near-shoring of supplies and less reliance on China for manufacturing. Asked by Seatrade Maritime News if these changes were being seen by the port yet Hoogsteden said: “We don’t really see anything changing yet. I think there will be some changes but I don’t think it will be as dramatic as some pundits will say it will be. The security of the supply chain is an area where increasing importance expected to be placed. “Security of supply chain is becoming more important, companies are really going to look not at just-in-time and lowest cost, but also the security of the supply chain and technology, digitalisation will help. Just in time will change to just in case, so I think there will be more slack in the supply chain, maybe more storage in ports or close to consumer areas.”

He also does expect to see some nearshoring and a diversification of manufacturing from China to other Asian countries including Indonesia, Vietnam and even back to Japan. “The flow of goods from Asia will remain to be very important, but also inter-European shipping will grow further. For us the good thing is Rotterdam is both an intercontinental port and an intra-European port,” Hoogsteden said.

Source: seatrade-maritime.com; 28 July 2020

DUBAI WITNESSES CREW CHANGE OF 3000 SEAFARERS WITHIN ITS TERRITORIAL WATERS

- MI News Network

Completing the success of the cooperation between the Dubai Maritime City Authority (DMCA) and the General Directorate of Residency and Foreigners Affairs – Dubai (GDRFA) to facilitate ships’ crew change, 3,000 seafarers have been recently registered within Dubai territorial waters, comprising 1700 sign-on and 1300 sign-off since DMCA announced the resumption of crew change. It is a remarkable achievement for Dubai, which is allowing crew change, offering a safe haven for those stranded on board their ships for several months due to the COVID-19 pandemic.

After DMCA’s decision to resume the procedures allowing for changing ships’ crews in ports and anchorage areas within the territorial waters of Dubai, it has witnessed growth in marine activities, while maintaining full compliance with the Dubai Health Authority and ensuring confirmed flights from the UAE. Competent authorities continue to receive hundreds of requests to change crews of different nationalities, in close coordination with DMCA, the port authorities, the Federal Authority for Identity and Citizenship, airlines, and continue to work with the Dubai Health Authority to facilitate the precautionary measures which will enable the crews to sign on and off from the ship as a top priority. Sheikh Saeed bin Ahmed bin Khalifa Al Maktoum, Executive Director of Dubai Maritime City Authority, explained that the increased activities of changing crews within the territorial waters reflect the growing confidence in Dubai’s leadership in the global maritime map. He noted that the emirate has provided all the means of guarantee to assist the sailors, which were held due to the exceptional global circumstances associated with COVID-19. Sheikh Saeed Al Maktoum highlighted DMCA’s commitment to enhance communication, cooperation, and coordination with the concerned authorities, Dubai ports and airports in the UAE to ensure smooth, efficient and reliable operations, and in line with international health protocols and precautionary measures followed by the emirate. He concluded: “The resumption of the marine crew change operations comes from our constant efforts to guarantee the highest levels of health, safety and security of seafarers, visitors and workers within the maritime sector.

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Source: marineinsight.com; 28 July 2020

FIRST ICE-BREAKING LNG CARRIER CALLS JAPAN FROM YAMAL

- Bob Jacques

Mitsui OSK Lines (MOL) reports that the ice-breaking LNG Carrier Vladimir Rusanov, has made its maiden call at the LNG Terminal in Ohgishima, Tokyo Bay, becoming the first ice-breaking LNGC to call at Japan.

MOL jointly owns and operates the Vladimir Rusanov with Cosco for the Yamal LNG project, The vessel departed the Yamal LNG plant at Sabetta port on 29 June, sailing eastwards along the Northern Sea Route (NSR) via the Kara Sea, the Laptev Sea, the East Bering Sea, the Chukchi sea, and the Bering Strait. Although the ice in the NSR "generally melts at this time of year," said MOL, some ice remained and the vessel proceeded cautiously on this trial voyage, arriving in Tokyo Bay on 23 July.

However, this 'summer route' via the NSR involves a sailing of only 4,900nm giving a potential journey time of 14 days at average navigation speed of 15 knots, points out the Japanese company, versus a 13,700nm 'winter route' taking 38 days at the same speed via the Suez Canal. MOL says it will continue actively working towards ensuring stable LNG transportation along the NSR, thereby opening up a new energy supply route to Asia and accumulating a deeper knowledge and understanding of Arctic vessel operations.

Source: [seatrade-maritime.com](https://www.seatrade-maritime.com); 27 July 2020

MARINE ENVIRONMENT

SOLID ACID NANO-SPONGES TRANSFORM CO₂ INTO FUEL AND PLASTIC WASTE INTO USEFUL CHEMICALS

- TATA INSTITUTE OF FUNDAMENTAL RESEARCH

Solid acids are amongst the most essential heterogeneous catalysts, which have the potential to replace environmentally harmful liquid acids, in some of the most important processes, such as hydrocarbon cracking, alkylation, as well as plastic waste degradation and carbon dioxide to fuel conversion. Two best known solid acids are crystalline zeolites and amorphous aluminosilicates. Although zeolites are strongly acidic, they are limited by their inherent microporosity, causing extreme diffusion limitation, whereas aluminosilicates are although mesoporous, they suffer from low acidity and moderate stability. Thus, it is a synthetic challenge to design and synthesize solid acids with both strong acidities like zeolites and textural properties like aluminosilicates, speculated as “Amorphous Zeolites,” which are ideally strongly acidic amorphous aluminosilicates. On the other hand, the primary cause of climate change is atmospheric carbon dioxide, whose levels are rising every day. The effect of global warming in terms of drastic changes in weather patterns is already clearly visible and alarming. There is, therefore, a great need to find ways to reduce carbon dioxide levels, either by sequestering it or by converting it to fuel. On the other hand, an excessive amount of plastic waste has become a serious environmental problem. Most of the countries generate thousands of tonnes of plastic waste every day. In this work, researchers dealt with both these problems at one stroke, by developing nano solid acids that transform carbon dioxide directly to fuel (dimethyl ether) and plastic waste to chemicals (hydrocarbons).

By using the techniques of bicontinuous microemulsion droplets as a soft template, Prof. Vivek Polshettiwar’s group at Tata Institute of Fundamental Research (TIFR), Mumbai, synthesized an acidic amorphous aluminosilicate (AAS), speculated as “Amorphous Zeolites,” with a nano-sponge morphology, exhibiting both zeolitic (strong acidity) and amorphous aluminosilicate (mesoporous high surface area) properties. The presence of zeolite-like bridging silanol in AAS was proved by various catalytic reactions (styrene oxide ring-opening, vesidryl synthesis, Friedel-Crafts alkylation, jasminaldehyde synthesis, m-xylene isomerization, and cumene cracking) which requires strong acidic sites and larger pore sizes. The synergy between strong acidity and accessibility was reflected in the fact that AAS showed better performance than state-of-the-art zeolites and amorphous aluminosilicates. This was also confirmed by detailed solid-state NMR studies. Thus, it was clear that the material possesses strongly acidic zeolite-like bridging silanol sites, even though materials are not crystalline but amorphous. They, therefore, fall into a new class of materials at the interface between crystalline zeolite and amorphous aluminosilicate.

Thus, the approach may allow the development of solid acid catalysis for plastic degradation as well as carbon dioxide to fuel, at the significant rates, scales, and stabilities required to make the process economically competitive. The protocol has scientific and technological advantages, owing to its superior activity and stability.

Source: [scitechdaily.com](https://www.scitechdaily.com); 31 July 2020

SCIENTISTS HAVE BACKED AWAY FROM THE WORST-CASE CLIMATE SCENARIO — AND THE BEST ONE TOO

- Umair Irfan

The basic mechanics of climate change are simple: Carbon dioxide in the atmosphere traps heat. More carbon dioxide means more heat is trapped across the Earth, causing it to warm up. But scaled up over the entire planet, these physical processes interact in a myriad of complex and sometimes unexpected ways. The Arctic reflects sunlight back into space. Clouds in some circumstances trap heat, and in others, they cool the region beneath them. Forests store a big chunk of carbon, but they're being burned, cut down, and dying off from warming. The ocean soaks up a huge amount of heat and carbon dioxide, but it can't absorb it forever. And these effects are not all linear; some may taper off as the planet heats up while others may suddenly accelerate.

That's why scientists for decades have struggled to answer the basic question of how much the earth will eventually warm up for a given amount of carbon dioxide in the atmosphere. The term for this parameter is equilibrium climate sensitivity. The classic way of framing it is asking what happens if we double the amount of carbon dioxide in the atmosphere compared to levels prior to the industrial revolution. Back in the 1800s, it was about 280 parts per million. Today, it's about 413 ppm. Some estimate it could reach 560 ppm as soon as 2050 without major mitigation steps. A team of 25 scientists from around the world recently took a stab at answering the question of how sensitive the Earth's climate is to carbon dioxide and came up with range of possibilities. Their results, published July 22 in *Reviews of Geophysics*, showed that the planet would most likely warm on average between 4.7 degrees Fahrenheit and 7 degrees Fahrenheit (2.6 degrees Celsius and 3.9 degrees Celsius) if atmospheric carbon dioxide were to double. This is still a wide span, but it's much smaller than prior estimated range of 2.7 and 9.1 degrees Fahrenheit (1.5 and 4.5 degrees Celsius) that had been the reigning benchmark for decades.

The new, narrower estimate for climate sensitivity has huge implications, not just for climate science, but for how humanity prepares for a warming world. It shows that the worst-case-scenario is not as dire as previously thought, but also that the best possibilities are still quite grim. In particular, it means that it will be almost impossible to hit the main target of the Paris climate agreement, limiting warming to less than 2 degrees Celsius (3.6 degrees Fahrenheit) this century, by chance; it will require aggressive action to reduce emissions with even less margin for delay.

Why climate sensitivity is so important to our understanding of climate change

In 1979, the National Research Council put together a report looking at the ways increasing carbon dioxide emissions would impact the world. The researchers behind the report understood even then that it would be a complicated task. “In order to address this question in its entirety, one would have to peer into the world of our grandchildren, the world of the 21st century,” they wrote. “A complete assessment of all the issues will be a long and difficult task.” It was this report that came up with the climate sensitivity range between 2.7 and 9.1 degrees Fahrenheit (1.5 and 4.5 degrees Celsius). Now that we’re in the 21st century, how much has our understanding of climate science improved? On many fronts, the gains in climate science have been vast and substantial. New measurements from ice cores, satellite monitoring, and sophisticated computer models have yielded new insights in the the climate of the past, present, and future. Scientists are even getting close to being able to see carbon dioxide emissions in real time. However, until recently, the estimates of climate sensitivity barely budged. The Intergovernmental Panel on Climate Change, a team of scientists assembled by the United Nations, came up with the same estimate climate sensitivity in 2014 as the National Research Council came up with in 1979. But not for lack of trying. “There have been a number of research studies over the years that have looked at the climate sensitivity range,” said Donald Wuebbles, a professor of atmospheric sciences at the University of Illinois and an author of the 2014 IPCC report who was not involved in the new paper, in an email. “The best of those studies had not been able to reduce this sensitivity from the range much differently than the traditional range of 1.5-4.5 C. Such a wide range for climate sensitivity makes it much harder to plan for the future, from how much oceans will rise, to where we can grow crops best, to what places will become too hot to inhabit. So a new smaller climate sensitivity range is significant. Since it’s a foundational parameter of climate models, it can yield a more precise range for what to expect as the world continues warming.

It took decades of advances in science to narrow the boundaries of climate sensitivity

Then how did this team of researchers chip away at a problem that has vexed climate scientists for more than 40 years? It wasn’t any one finding in particular. Rather, the team took the colossal body of research that has built up in the intervening decades to create their sensitivity estimate. They drew on paleoclimate records dating back 3 million years, observational temperature records over the last 150 years, and a new generation of climate models. “The single biggest factor was the ability to combine estimates from these three independent lines of evidence,” explained Zeke Hausfather, director of climate and energy at the Breakthrough Institute and a coauthor of the new paper. Baked into these lines of evidence is a better understanding of underlying phenomena like how albedo — the reflectiveness of the earth’s surface — changes as the air warms, how aerosols form and reflect sunlight, and how natural variability in the climate factors in. Hausfather added that in recent years, scientists have gained to insight into feedback loops in the climate that can enhance warming. That means that over time, greenhouse gas emissions will pack a bigger punch for the climate “We’d expect a bit more warming, all things being equal, in the future from emissions than we have today,” he said. The resulting estimate of climate sensitivity — 4.7 degrees to

7 degrees Fahrenheit (2.6 degrees Celsius and 3.9 degrees Celsius) — may seem small, but it represents a drastic shift from the world as we know it today. In an editorial in the Hill, Hausfather pointed out that during the last ice age 20,000 years ago, the planet was on average 9 degrees Fahrenheit (5 degrees Celsius) cooler than today. That led to so much ice across the planet that global sea levels were 300 feet lower than they are today.

It's also important to remember that the climate is already changing, providing some real-world results for how the climate system responds to carbon dioxide. The world has warmed more than 1 degree Celsius since the dawn of the Industrial Revolution. Sea levels have risen more than 8 inches since 1880, and the rate is accelerating. Even if humanity were to halt emissions now, there is still inertia in the climate system and the planet would likely continue warming by a certain amount.

And while much of climate discussions center on changes in average temperatures, those shifted averages obscure the fact that there can be drastic increases in the extremes. Scientists have found signals of human caused emissions in the growing intensity of hurricanes, the frequency of heat waves, and the drying of some forests, a key ingredient in wildfires. Could scientists narrow the boundaries of climate sensitivity even more? "It's difficult," Wuebbels said. "I would expect though that after another decade (or so) of climate changes and the observations of climate relevant processes that the range should be able to be reduced further." However, the world can't wait another decade for better information to act, and Ploy Pattanun Achakulwisut, a climate scientist at the Stockholm Environment Institute, said the new findings are a call to action. "This study is an important milestone for the climate science community, and only serves to strengthen what the public and policymakers have known for decades: that we need to transition away from fossil fuels," she wrote in an email. Achakulwisut added that the results emphasize the need for leaders to create policies to speed up the move toward low-carbon energy.

Human action remains the greatest uncertainty for the global climate

While the new climate sensitivity estimate gives the world a clearer vision of the future, it is a future that can still be altered by our actions. Indeed, the biggest factor shaping the future of the climate, and the greatest source of uncertainty, is what humans will do about it in the coming years. Power plants, farms, aircraft, trucks, buildings, deforestation, and other human-sources collectively spew carbon dioxide into the air at a rate of 2.6 million pounds per second, making humans the dominant source of changes in the climate over the past 50 years. And that rate is accelerating: More than half of all human greenhouse gas emissions occurred in just the last 30 years. The question is how long this will continue and when the curve of carbon dioxide emissions will bend. However, like climate sensitivity, there has been some narrowing of what to expect in recent years. Current human greenhouse gas emissions are now much less likely to follow the most pessimistic trajectory, which assumes unchecked growth of fossil fuel combustion and little to no efforts to limit climate change. The dirtiest sources of energy are now declining, and some parts of the world are making progress to cut emissions while others have signed onto aggressive targets. But emissions are still rising, and limiting climate change demands cutting them drastically, and soon.

A 2018 report from the IPCC examined what people would have to do to meet the more aggressive target under the Paris climate agreement, limiting warming to less than 1.5 degrees Celsius. The report concluded that the world's greenhouse gas emissions need to be half of where they are now by 2030, zero by 2050, and thereafter emissions would actually have to be removed from the atmosphere to stabilize the climate. That goal is almost certainly out of reach. The emissions gap between where the world is and where it needs to be is only getting wider. And now with the latest estimate of climate sensitivity, the low-end estimate of climate sensitivity has gone up, meaning there's virtually no chance of staying below 2 degrees Celsius of warming if carbon dioxide concentrations reach 560 ppm. Even with the inherent uncertainties of these forecasts, these factors point toward a need for more concerted action to curb greenhouse gases. "When it comes to climate, uncertainty is not our friend because the damages of climate change increase non-linearly," Hausfather said. "Because there are some uncertainties we are never really going to be able to get rid of, it really suggests we need to be cautious about our emissions." The problem of dangerous levels of global warming can still be solved, but the easiest options are off the table, and the longer we wait, the harder it gets.

Source: [vox.com](https://www.vox.com); 31 July 2020

SIBERIA'S 'GATEWAY TO THE UNDERWORLD' GROWS AS RECORD HEAT WAVE THAWS PERMAFROST

- Richard Stone

On a spring day in 2019, Alexander Kizyakov rappelled down the 60-meter headwall of the Batagay megaslump in eastern Siberia, pausing to chisel out chunks of ice-rich soil that had been frozen for eons. "One of my hobbies is rock climbing," says Kizyakov, a permafrost scientist at Lomonosov Moscow State University. Colleagues below sampled the most ancient soil along the base of the cliff. Such work is too dangerous in summertime, when the constant crackling of melting ice is punctuated by groans as slabs of permafrost, some as big as cars, shear off the headwall.

Known to locals as the "gateway to the underworld," Batagay is the largest thaw slump on the planet. Once just a gully on a slope logged in the 1960s, the scar has expanded year by year, as the permafrost thaws and meltwater carries off the sediment. Now more than 900 meters wide, it epitomizes the vulnerability of permafrost in the Arctic, where temperatures have shot up twice as fast as the global average over the past 30 years. But it is also a time capsule that is seducing scientists with its snapshots of ancient climates and ecosystems. "It's a mind-blowing place," says Thomas Opel, a paleoclimatologist at the Alfred Wegener Institute. Dates from ice and soil gathered at Batagay show it holds the oldest exposed permafrost in Eurasia, spanning the past 650,000 years, Opel and colleagues reported in May at the European Geosciences

Union’s online general assembly. That record could reveal how permafrost and surface vegetation responded to past warm climates. “It gives us a window into times when permafrost was stable, and times when it was eroding,” Opel says. Global warming is inflicting wounds across Siberia.

Outbursts of pent-up methane gas in thawing permafrost have pocked Russia’s desolate Yamal and Gydan peninsulas with holes tens of meters across. Apartment buildings are listing and collapsing on the unsteady ground, causing about \$2 billion of damage per year to the Russian economy. Forest fires during the past three summers have torched millions of hectares across Siberia, blanketing the land with dark soot and charcoal that absorb heat and accelerate melting. Intensifying this year’s fires was a heat wave that baked Siberia for the first half of 2020. On 20 June, the town of Verkhoyansk, just 75 kilometers from Batagay and one of the coldest inhabited places on Earth, reached 38°C, the hottest temperature ever recorded in the Arctic. The record-breaking heat “would have been effectively impossible without human-induced climate change,” said the authors of a 15 July study by World Weather Attribution, a collaboration of meteorologists who analyze the possible influence of climate change on extreme weather events. An abiding question is how much carbon the thawing soil will release to the atmosphere, and whether the lush growth of Arctic plants in the warming climate will absorb enough carbon to offset the release. The Arctic may already have reached a tipping point: Based on observations at 100 field sites, northern permafrost released on average about 600 million tons more carbon than vegetation absorbed each year from 2003 to 2017, scientists estimated in October 2019.

Scientists are venturing to Batagay in annual campaigns to learn what it can say on the matter. Visits, organized by the Institute of Applied Ecology of the North in Yakutsk, are not for the faint of heart. In 2014, Kseniia Ashastina slogged through 3 kilometers of mosquito-infested forest to reach the headwall’s edge. “You hear a lot of cracking noises as you get closer, and all of a sudden there are no trees and you’re standing on an overhang,” says Ashastina, a paleobotanist at the Max Planck Institute for the Science of Human History. She and colleagues from the Senckenberg Research Institute and Natural History Museum lodged with Indigenous Siberians—Evens and Sakha—some of whom fear the megaslump. “They say it’s eating their land, swallowing up the trees and their sacred places,” she says.

To learn the age of the exposed permafrost, Opel’s team relies on luminescence dating, which reveals the last time minerals in the soil saw daylight, and a new Russian technique for dating chlorine in the ice. The dates allow them to match soil layers to the known climate record, while abundances of two isotopes trapped in ice wedges, oxygen-18 and deuterium, are proxies for local temperatures. Assaying Batagay’s soil composition should yield insights into how much carbon the permafrost sequestered over the millennia.

The permafrost also holds glimpses of ancient Arctic ecosystems. Sampling trapped plant remains, the team learned that during the last ice age, when winter temperatures plunged even lower than in modern times, the vegetation was surprisingly lush, supporting woolly mammoths, woolly rhinos, and other now-vanished herbivores in a

meadow steppe ecosystem. “It was a paradise for the foraging animals,” Ashastina says.

Sometimes, the remains of these lost creatures tumble out of the headwall in exquisite condition. In 2018, scientists recovered a young ginger-colored Lena horse (*Equus lenensis*), an extinct relative of the Yakutian horse, with intact soft tissue. Scientists hope to find a live cell so they can attempt to clone the 42,000-year-old foal. Some of its preserved muscle is particularly promising, says P. Olof Olsson, a molecular biologist with the Abu Dhabi Biotech Research Foundation, which is teaming up on the effort with North-Eastern Federal University in Yakutsk. “I’m skeptically optimistic,” Olsson says. “At least, it’s not impossible.” As the elements carve up more of the Batagay megaslump, it could transport scientists deeper into time. Glaciers scour away soil as they advance, but they largely bypassed Siberia during recent ice ages, leaving the permafrost in some areas hundreds of meters thick. For decades, as the hot summers liquefied its ice-rich soil, Batagay’s headwall advanced about 10 meters per year, says Frank Guenther, a permafrost researcher at the University of Potsdam. Since 2016, he says, that rate has surged to 12 to 14 meters per year. It’s harder to peg how fast the slump is deepening, and thus how much farther back in time the thaw is penetrating. The most ancient permafrost ever dated, from Canada’s Yukon territory, is 740,000 years old. As much as climate watchers may cringe at the thought, several more roasting Siberian summers could push the Batagay megaslump to claim another record.

Source: [sciencemag.org](https://www.sciencemag.org); 28 July 2020

NEW SOIL MODELS MAY EASE ATMOSPHERIC CO₂, CLIMATE CHANGE

- Stockholm University

In an article published July 27 in *Nature Geoscience*, with Johannes Lehmann at Cornell University as lead author and with Stefano Manzoni at Stockholm University as one of the co-authors, the authors argue that scientists should develop new models that more accurately reflect the carbon-storage processes beneath our feet, in order to effectively draw down atmospheric carbon dioxide. Managing soils properly could allow stabilizing carbon in soils, thus mitigating climatic changes. However, it is not easy to identify management strategies that ensure efficient carbon stabilization. In the article the researchers argue that we need to ‘think like a decomposer’ to define effective carbon sequestration strategies.

Three types of challenges

Microbial decomposers in soils face three types of challenges, which is referred to as ‘functional complexities’—soil organic matter is chemically diverse (requiring metabolically costly enzymes to break down), it is often out of reach (physically

separated from the microorganisms), and its availability varies strongly through time (depending on environmental conditions). “Because microbial activity promotes soil organic matter decomposition and decreases carbon persistence, we suggest that management strategies that make microbial life more challenging will also improve carbon persistence. For example, using cover crops and rotations in agricultural fields increases chemical diversity in the plant residues, which in turn can promote carbon persistence in soils. Similarly, tillage should be avoided to maintain the spatial distancing between organic matter and microorganisms, which also promotes carbon persistence,” said Stefano Manzoni.

Developing new mathematical tools

Modeling and thus prediction of the effects of spatial heterogeneity in soils (the second of the complexities discussed in the article) is particularly challenging. While intuitively simple, the idea that organic carbon located far from microorganisms is more persistent, is not easy to describe mathematically. This is the problem that Arjun Chakrawal (a PhD student in Stefano Manzoni’s lab) is tackling. He has developed mathematical tools to link the spatial distribution of organic carbon to the capacity of microorganisms to degrade it. With these tools, he provided strong theoretical support for the idea that spatial heterogeneity promotes carbon persistence.

Need for new soil carbon-persistence models

The international, interdisciplinary group of scientists propose the creation of new soil carbon-persistence models through the lens of “functional complexity” – the interplay between time and space in soil carbon’s changing molecular structure. With new models, scientists believe they can find out exactly how sequestration works. It could then be properly reflected in the next assessment of the United Nations Intergovernmental Panel on Climate Change (IPCC) – which likely will address drawing down atmospheric carbon.

Source: su.se; 29 July 2020

CARBON EMISSIONS ARE CHILLING THE ATMOSPHERE 90 KM ABOVE ANTARCTICA

- John French

While greenhouse gases are warming Earth's surface, they're also causing rapid cooling far above us, at the edge of space. In fact, the upper atmosphere about 90 kilometres (56 miles) above Antarctica is cooling at a rate 10 times faster than the average warming at the planet's surface. Our new research has precisely measured this cooling rate, and revealed an important discovery: a new four-year temperature cycle in the polar atmosphere. The results, based on 24 years of continuous measurements by Australian scientists in Antarctica, were published in two papers this month. The

findings show Earth's upper atmosphere, in a region called the "mesosphere", is extremely sensitive to rising greenhouse gas concentrations. This provides a new opportunity to monitor how well government interventions to reduce emissions are working. Our project also monitors the spectacular natural phenomenon known as "noctilucent" or "night shining" clouds. While beautiful, the more frequent occurrence of these clouds is considered a bad sign for climate change.

Studying the 'airglow'

Since the 1990s, scientists at Australia's Davis research station have taken more than 600,000 measurements of the temperatures in the upper atmosphere above Antarctica. We've done this using sensitive optical instruments called spectrometers. These instruments analyse the infrared glow radiating from so-called hydroxyl molecules, which exist in a thin layer about 87 kilometres (54 miles) above Earth's surface. This "airglow" allows us to measure the temperature in this part of the atmosphere. Our results show that in the high atmosphere above Antarctica, carbon dioxide and other greenhouse gases do not have the warming effect they do in the lower atmosphere (by colliding with other molecules). Instead the excess energy is radiated to space, causing a cooling effect. Our new research more accurately determines this cooling rate. Over 24 years, the upper atmosphere temperature has cooled by about 3 degrees C, or 1.2 degrees C per decade. That is about ten times greater than the average warming in the lower atmosphere – about 1.3 degrees C over the past century.

Untangling natural signals

Rising greenhouse gas emissions are contributing to the temperature changes we recorded, but a number of other influences are also at play. These include the seasonal cycle (warmer in winter, colder in summer) and the Sun's 11-year activity cycle (which involves quieter and more intense solar periods) in the mesosphere. One challenge of the research was untangling all these merged "signals" to work out the extent to which each was driving the changes we observed. Surprisingly in this process, we discovered a new natural cycle not previously identified in the polar upper atmosphere. This four-year cycle which we called the Quasi-Quadrennial Oscillation (QO), saw temperatures vary by 3-4 degrees C in the upper atmosphere. Discovering this cycle was like stumbling across a gold nugget in a well-worked claim. More work is needed to determine its origin and full importance.

But the finding has big implications for climate modelling. The physics that drive this cycle are unlikely to be included in global models currently used to predict climate change. But a variation of 3-4 degrees C every four years is a large signal to ignore. We don't yet know what's driving the oscillation. But whatever the answer, it also seems to affect the winds, sea surface temperatures, atmospheric pressure and sea ice concentrations around Antarctica.

'Night shining' clouds

Our research also monitors how cooling temperatures are affecting the occurrence of noctilucent or "night shining" clouds. Noctilucent clouds are very rare – from Australian Antarctic stations we've recorded about ten observations since 1998. They occur at an altitude of about 80 kilometres (50 miles) in the polar regions during summer. You can only see them from the ground when the sun is below the horizon during twilight, but still shining on the high atmosphere. The clouds appear as thin, pale blue, wavy filaments. They are comprised of ice crystals and require temperatures around minus 130 degrees C (266 F) to form. While impressive, noctilucent clouds are considered a "canary in the coalmine" of climate change. Further cooling of the upper atmosphere as a result of greenhouse gas emissions will likely lead to more frequent noctilucent clouds. There is already some evidence the clouds are becoming brighter and more widespread in the Northern Hemisphere.

Measuring change

Human-induced climate change threatens to alter radically the conditions for life on our planet. Over the next several decades - less than one lifetime - the average global air temperature is expected to increase, bringing with it sea level rise, weather extremes and changes to ecosystems across the world. Long term monitoring is important to measure change and test and calibrate ever more complex climate models. Our results contribute to a global network of observations coordinated by the Network for Detection of Mesospheric Change for this purpose. The accuracy of these models is critical to determining whether government and other interventions to curb climate change are indeed effective. The Conversation

John French, Atmospheric physicist, University of Tasmania; Andrew Klekociuk, Principal Research Scientist, Australian Antarctic Division and Adjunct Senior Lecturer, University of Tasmania, and Frank Mulligan, , National University of Ireland Maynooth.

Source: sciencealert.com; 28 July 2020

A FRONT-ROW SEAT FOR THE ARCTIC'S FINAL SUMMERS WITH ICE

- Laura Millan Lombrana, Anna Shiryaevskaya, Dina Khrennikova, Olga Tanas,
and Mira Rojanasakul

On a sparkling day in May, the nearly 300-meter-long tanker Christophe de Margerie set sail from the northern Russian port of Sabetta. Crossing the so-called Northern Sea Route in the Arctic waters, in just under three weeks it moored at the Chinese port of Yangkou, unloading its shipment of liquefied natural gas. That relatively routine journey has now entered the record books: the earliest date a cargo ship took what's usually an ice-blocked route. It's yet another sign of how climate change is shrinking the Arctic. Around the same time the gas reached port, a ship called the Polarstern was

also sailing in Arctic waters. But it was loaded with about 100 climate scientists from some 20 countries engaged in an exhaustive, year-long examination of the warming environment. To put it another way, the crew of the scientific ship is trying to understand why the tanker was able to leave so early in the season and what it means for the future of the planet.

Around the same time the gas reached port, a ship called the Polarstern was also sailing in Arctic waters. But it was loaded with about 100 climate scientists from some 20 countries engaged in an exhaustive, year-long examination of the warming environment. To put it another way, the crew of the scientific ship is trying to understand why the tanker was able to leave so early in the season and what it means for the future of the planet. Unlike other areas of the planet, the Arctic is so inaccessible that there's very little data to predict with precision how the ice cap will change under rapid warming. Researchers on the Polarstern's MOSAiC mission—the largest polar expedition in history and the first modern vessel to spend a full winter close to the North Pole—are aiming to fill in the gaps of knowledge.

Scientists are certain that the Arctic ice is disappearing. The shrinking ice cap accelerates warming globally. As Greenland and other Arctic glaciers lose ice, they help raise sea levels, potentially exposing millions of people to flooding. Nearly every dramatic, headline-grabbing effect of climate change, from alarming coastal erosion to intense and frequent fires, is already happening in the Arctic, at a fast pace and at a giant magnitude.

“These individual things are part of a very complex system that's changing dramatically,” says Guido Grosse, head of the permafrost research unit at the Alfred Wegener Institute, Helmholtz Institute for Polar and Sea Research, or AWI. “Because it is very remote people have a hard time understanding how it might affect our life in more temperate regions. But it will. About a third of the size of the Christophe de Margerie gas tanker, the Polarstern is almost like a second home for polar scientists. The ship has been sailing Arctic and Antarctic waters for almost four decades. Spending months on the blue and white research vessel means sharing a tiny cabin with another scientist, sleeping in tight bunk beds and sipping infinite amounts of tea and coffee in the ship's Red Saloon.

A satellite internet connection allows the researchers to communicate with loved ones on the mainland via Whatsapp. On the long winter days, Agatha Christie-style murder mystery games are organized to kill the hours. Friendships are forged—and broken—and the vessel's sauna, gym and the small swimming pool become welcomed distractions. With no goals and multiple balls, scientists have invented a special discipline of water polo that only exists on the Polarstern. The centuries-old quest to establish a northern navigation route that would connect Russia with Asian ports, the one taken by the Christophe de Margerie, helps illustrate the Arctic's transformation. That route has long been a strategic priority for Russia, which accounts for over half of the total Arctic coastline. The reason is obvious: The Northern Sea Route, stretching more than 3,000 nautical miles between the Barents Sea and the Bering Strait, provides a shortcut to Pacific ports. Shippers could send oil, gas and metals such as nickel and palladium to Asia more quickly, potentially shaving costs.

So far, Russia's largest liquefied-gas producer, Novatek PJSC, and the nation's largest private oil producer, Lukoil PJSC, send their eastbound cargoes via the route during summer. The issue, of course, is that the Arctic waters are covered with ice nearly round the year, with only a few areas completely ice-free even in summer, a trend that has historically frustrated shippers and explorers alike. An Englishman named Sir Hugh Willoughby gave the route a shot in 1553. He described "very evil weather" and "terrible whirlwinds" as he attempted to find a northeastern passage. A year later, his diaries were found along with his frozen body and the rest of his crew on the Kola Bay, in a place he named "the heaven of death." The first to succeed in crossing was adventurer Adolf Erik Nordenskiöld, who spent the winter months of 1878 and 1879 stuck in the ice aboard the Vega before finding his way. In 1932, Polar explorer Otto Schmidt on board Soviet icebreaker Alexander Sibiryakov completed the first ever uninterrupted voyage through the route, taking four summer months. That got the attention of Soviet leader Joseph Stalin. He created an authority, Glavsevmorput, and charged it with maintaining what is now known as the Northern Sea Route. By the turn of this century, traffic exploded as periods of ice-free conditions grew longer and longer. Russian scientist Alexander Yulin recalls how only two or three decades ago the summer navigation period in the Russian Arctic lasted just 80 days a year. "Now, it's 120, and most recently even as many as 150 days," says Yulin, who runs the science lab that prepares ice outlooks for Russia's state-owned Northern Sea Route Administration. That may be conservative. A 2014 research paper from Kyoto University estimates that if navigation in the Northern Sea Route is extended to around 225 days per year, it may be economically viable to use the Arctic link during that entire period (with the Suez Canal used the remainder of the year).

These changes will prove a huge boon for Russia, which extracts almost 90% of its natural gas and more than 17% of its oil output from the Arctic zone. The region also contains around nearly all of Russia's platinum and palladium reserves, and accounts for 97% of the nation's nickel production. Rosatom, the Russian state-owned nuclear corporation in charge of managing the route, is forecasting a big jump in shipments of these products through the Northern Sea Route. The company now navigates it, deploying nuclear icebreakers for nine months of the year. Ice-class vessels such as the Christophe de Margerie don't need icebreakers in summer, though the early journeys this year did require assistance for part of the route. But Rosatom won't wait for global warming to run its course. It's looking at year-round navigation starting in 2025, with help from more powerful icebreakers.

Andrew Dale is a captain on another ice-class liquefied natural gas carrier that sailed the Arctic route this spring. His pictures posted on LinkedIn show calm water, blue skies and even a playful polar bear— nothing like harsh forces that doomed Sir Willoughby. "The salary doesn't always just go into the bank," Dale wrote in testament to the beautiful scenery. He also acknowledged that it had been one of the most challenging navigations in his career.

Scientists aboard the Polarstern are trying to better understand the mechanics driving that difference across the centuries. Their vessel sailed into Arctic currents last September, turned the engines off and began drifting toward the North Pole. Their

task: to peer into the mass of its ice and snow and measure everything, from its atmosphere to its chemistry and ecosystem. The mission mirrors that of Norwegian explorer and scientist Fridtjof Nansen, who drifted north sailing on a wooden ship 127 years ago. “Things that we will experience over the next couple of decades are already happening in the Arctic,” says Grosse, the AWI researcher, who, while not onboard this journey, has been to the Arctic dozens of times before on scientific missions. Most scientific models suggest that the first ice-free Arctic summer could happen around the middle of this century. There are more pessimistic forecasts suggesting total melting of the ice cap in summer could happen before, and optimistic outliers pointing to some time after 2100.

By the end of summer 2019, the Arctic ice cap had shrunk to the second-lowest level since satellite monitoring started in 1979. As of last week, on July 18, it was 26% lower than the historical average for the day. The Arctic is currently on track to record the lowest-ever ice coverage for the whole season. A study released in March estimated that the Arctic and Greenland lost ice during the 2010s at a rate six times greater than in the 1990s. That’s causing ocean levels to increase, leading some Arctic coastlines to lose as much as 50 meters to the sea annually. It’s a scope and speed of change that doesn’t require scientific skills to observe. “Climate change is obvious,” says Vyacheslav Konoplev, 68, who has spent his life in the Arctic. “The ice is thawing and becoming thinner.” He now works at Russian miner Norilsk Nickel, managing a fleet shipping metal from the miner’s Arctic facilities to the northwestern port of Murmansk.

The Arctic is warming so fast that it has become an accelerator of climate change in the rest of the world. The white surface of the ice cap helps reflect sunlight back into space, effectively cooling the planet. When the ice melts, it’s replaced by ocean, which is dark and absorbs the light, heating up the sea surface. “This affects oceanic and atmospheric circulation in the northern Atlantic, which has effects in faraway places like New York or Germany,” Grosse says.

The heat is speeding up the thawing of permafrost, the frozen ground that covers much of Russia’s Siberia, Alaska in the U.S. and the Yukon territories in Canada. When permafrost thaws, the organic matter that has been stored there since the ice age releases greenhouse gases such as carbon dioxide and methane into the atmosphere. Drier ground and high temperatures are also leading to seasonal fires that are starting earlier in the year, lasting longer and burning larger areas of land. Last year’s fire season was the worst in those terms, as well as in the amount of carbon dioxide emitted. This year the seasonal fires started even earlier and have so far released even more carbon dioxide. Stefanie Arndt, a sea physicist at AWI in Germany, boarded mid-voyage in March as the leader of the ice team. A seasoned scientist, she had been on board the vessel seven times before. Yet this one was different, spending so much time in the ice and so close to the North Pole.

It didn’t start auspiciously. A landing strip built on the ice for emergency evacuations fell apart, trapping the scientists who were supposed to end their shift and return home by plane. But Arndt eventually made it home in June. “When you compare the extent of the sea ice with previous decades you see that it is decreasing,” she says. Timing the

exact moment when the Northern Sea Route will become ice-free is tough. “This decade or the next one,” Arndt says, “but it will come for sure.”

— *With assistance from Yuliya Fedorinova*

Source: [Bloomberg.com](https://www.bloomberg.com); 27 July 2020

SCIENTISTS PULL LIVING MICROBES, POSSIBLY 100 MILLION YEARS OLD, FROM BENEATH THE SEA

- Elizabeth Pennisi

Microbes buried beneath the sea floor for more than 100 million years are still alive, a new study reveals. When brought back to the lab and fed, they started to multiply. The microbes are oxygen-loving species that somehow exist on what little of the gas diffuses from the ocean surface deep into the seabed. The discovery raises the “insane” possibility, as one of the scientists put it, that the microbes have been sitting in the sediment dormant, or at least slowly growing without dividing, for eons. The new work demonstrates “microbial life is very persistent, and often finds a way to survive,” says Virginia Edgcomb, a microbial ecologist at the Woods Hole Oceanographic Institution who was not involved in the work.

What’s more, by showing that life can survive in places biologists once thought uninhabitable, the research speaks to the possibility of life elsewhere in the Solar System, or elsewhere in the universe. “If the surface of a particular planet does not look promising for life, it may be holding out in the subsurface,” says Andreas Teske, a microbiologist at the University of North Carolina, Chapel Hill, who was also not involved with the new study. Researchers have known that life exists “under the floorboards” of the ocean for more than 15 years. But geomicrobiologist Yuki Morono of the Japan Agency for Marine-Earth Science and Technology wanted to know the limits of such life. Microbes are known to live in very hot or toxic environments, but can they live where there’s little food to eat? To find out, Morono and his colleagues mounted a drilling expedition in the South Pacific Gyre, a site of intersecting ocean currents east of Australia that is considered the deadest part of the world’s oceans, almost completely lacking the nutrients needed for survival. When they extracted cores of clay and other sediments from as deep as 5700 meters below sea level, they confirmed the samples did indeed contain some oxygen, a sign that there was very little organic material for bacteria to eat. To explore what life might be there, Morono’s team carefully extracted small clay samples from the centers of the drilled cores, put them in glass vials, and added simple compounds, such as acetate and ammonium, that contained heavier forms—or isotopes—of nitrogen and carbon that could be detected in living microbes. On the day when the group first “fed” the mud samples with these compounds, and up to 557 days later, the team extracted bits of clay from

the samples and dissolved it to spot any living microbes—despite the lack of food for them in the clay.

The work was challenging. Typically, there are at least 100,000 cells per cubic centimeter of seafloor mud. But in these samples, there were no more than 1000 bacteria in the same amount of sediment. So, the biologists had to develop specialized techniques such as using chemical tracers to detect whether any contaminating seawater got into the samples and developing a way to analyze very small amounts of cells and isotopes. “The preparation and care needed to do this work was really impressive,” says Kenneth Nealson, an environmental microbiologist retired from the University of Southern California.

The added nutrients woke up a variety of oxygen-using bacteria. In samples from the 101.5-million-year-old layer, the microbes increased by four orders of magnitude to more than 1 million cells per cubic centimeter after 65 days, the team reports today in *Nature Communications*. Others have found bacteria in oxygenated sediments under the sea floor. Last year, William Orsi, a geobiologist at the Ludwig Maximilian University of Munich described living bacteria from 15-million-year-old sediments, a previous record. “But this study pushes it back by another order of magnitude in terms of geological time,” Orsi notes. Genetic analysis of the microbes revealed they belonged to more than eight known bacterial groups, many of which are commonly found elsewhere in saltwater where they play important roles in breaking down organic matter. “It suggests that learning to survive under conditions of extreme energy limitation is a widespread ability,” Nealson says, one that may have evolved early, when there was not much for microbes to feed on. “It may have been a very handy survival trick.”

The researchers don’t know what the gyre microbes have been doing all these millions of years. Most of the species they found do not form spores, which are an inactive life stage that some bacteria form in unfavorable conditions. It could be the bacteria have been dividing very slowly all this time, which would make those isolated in this study the distant descendants of ancestors millions of years old. But there’s so little food in the deep-sea sediments that any microbes there could most likely do little more than repair any damaged molecules. “If they are not dividing at all, they are living for 100 million years, but that seems insane,” says Steve D’Hondt, an oceanographer at the University of Rhode Island, Bay Campus, and co-author of the study. He wonders whether there’s another unrecognized source of energy—perhaps radioactivity—down there that allows slow division by the bacteria, which likely got trapped in these sediments as they were buried by other settling sediments. But the bottom line, says Bo Barker Jørgensen, a marine microbiologist at Aarhus University who was not involved with the work, is “low food and energy seem not to set the ultimate limit for life on Earth.”

Source: [sciencemag.org](https://www.sciencemag.org); 28 July 2020

GEOPOLITICS

WITH INDIA-US BADLY COORDINATED IN INDIAN OCEAN, CHINA-IRAN NAVAL TIES NOW A FRESH CONCERN

- Abhijit Singh

Iran's recent decision to drop India from the Chabahar-Zahidan railway line project has been the subject of some consternation in Indian strategic circles. The development has generated disquiet in New Delhi, where some have questioned the timing of the move by Iran. As Indian observers see it, the railway line was part of a strategic endeavour: the development of Chabahar port and an associated rail-links to circumvent Pakistan and its traditional obstruction of India's overland routes into Central Asia and Afghanistan. Amidst US sanctions, as Delhi searched for suppliers and funding, Tehran suddenly (and unilaterally) decided to go it alone. Oddly, this comes at a time when China has made itself available to assist in the project. More worrying for Indian watchers is the prospect of a comprehensive military and trade partnership between Iran and China. Beijing, ostensibly, has undertaken to invest \$400 billion in key sectors of Iran's economy, in return for an assured supply of Iranian fuel for the next 25 years. The proposed investment is the biggest China has ever pledged to any country as a part of its Belt and Road Initiative (BRI), and envisages huge expenditure in building Iran's oil and gas and infrastructure sector (\$280 billion and \$120 billion respectively). Beijing also plans to station over 5,000 Chinese security personnel to protect the investments in Iran.

The implications of a China-Iran strategic partnership are particularly stark in the maritime arena. According to a leaked 18 page draft agreement, parts of which were published by the New York Times last week, Chinese construction companies are set to initiate multiple infrastructure projects along Iran's Gulf coastline, including free-trade zones in Abadan, a city on the eastern bank of the Shatt Al-Arab River, and on the island of Qeshm, where Tehran is planning a major hub for oil production and storage. China will also build infrastructure at Jask, a port city just outside of the Strait of Hormuz, only 150 miles away from Gwadar, where a Chinese company has already developed and operating a port. Observers say a rudimentary Chinese naval presence at Jask could lead to greater joint military training and exercises between Iran, China and Pakistan, enhancing China's regional security profile.

To be sure, there is no cause for alarm yet. It is worth noting that the Iranian Revolutionary Guards navy (IRGCN), that is responsible for the waters of the Gulf, is opposed to any foreign naval presence at Iranian ports. The IRGCN controls the Imam Ali naval base in Chabahar, and also has a presence in Bandar-e-Jask and the island of Qeshm. An armed force of radicalized cadres loyal to Iranian Supreme Leader,

Ayatollah Khomeini, the Republican Guards' Corps has a two point agenda: to protect the revolution and counter the United States. The IRGCN, that uses asymmetric tactics to harass the USN in the Straits of Hormuz, has been instrumental in keeping foreign military activity in Iranian ports to a minimum, and there have been no foreign bases on Iranian soil since 1979. As much as the Iran-China pact creates possibilities for greater Chinese influence in Gulf region, analysts say the IRGC leadership is unlikely to allow a substantial PLA presence in Iranian ports. In the wider context of Western Indian Ocean region, however, the China-Iran agreement has greater significance. The PLA, which already possesses base in Djibouti, has been gradually expanding its military footprint on Africa's Eastern seaboard, and in the Northern Indian Ocean. A comprehensive strategic pact with Iran, analysts posit, could allow China to establish military presence along the Iran-Pakistan coastline; the PLA could even assist in the creation of a surveillance network to monitor US and Indian naval activity in the region. With the benefit of Chinese support, and an oil terminal outside the Hormuz, Iran could also be emboldened into adopting a more aggressive stance inside the Persian Gulf. Notwithstanding the abundant caution the PLAN has displayed in the Gulf region so far, there has been an uptick in Chinese naval engagements with Iran and other regional states. Last year, the PLAN held a trilateral exercise with Iran and Russia, signaled a desire for greater presence in the Northern Indian Ocean. If Iran builds a permanent base in the Indian Ocean, as announced by the head of the IRGCN last year, analysts say Chinese warships could well be frequent visitors at the facility. A proposed a tie-up between Gwadar and Chabahar, could exacerbate India's predicament. For the Indian navy, already troubled by the China – Pakistan maritime nexus, the development of China-Iran naval ties isn't good news.

Expectedly, many in New Delhi are blaming the United States for the dip in Indian fortunes in Chabahar. The crisis of faith in India-Iran relations, they aver, could well have been avoided had Washington not systematically alienated Tehran. As US sanctions have forced India to reduce its oil imports from Iran, Tehran has lost faith in New Delhi as a reliable partner. What is more, pressure from the Trump Administration has forced the Iranian government's hand in ways that have hurt Indian interests.

This also highlights a contradiction in India's maritime relationship with the US: it's a relationship that works well in the Eastern Indian Ocean, where Indian and American interests neatly align, but is somewhat constrained in the Western Indian Ocean, where there is a divergence of perspectives. Importantly though, New Delhi's strategic interests are "weighted west": the oil flows are from west, the bulk of trade is west, as is the diaspora, and India major investments. Not only are India and the US badly coordinated in the Western Indian Ocean, observers say Washington's Iran policy actively impinges on Indian interests. Policymakers in Washington and New Delhi must, then, recognize the need for better coordination on Iran. Greater Chinese naval presence in the Northern Indian Ocean in coming years raises the prospects of greater instability and elevated tensions in the Gulf region. The USN and IN have every reason to work together in the Western Indian Ocean, synergizing operations to preserve peace, even as they strive to exert strategic influence in the littorals.

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HOW DID THE SOUTH CHINA SEA DISPUTE BEGIN AND WHERE IS IT HEADED?

- ANI

In the past week, both the United States and Australia rejected large parts of China's extensive maritime claims in the South China Sea, as well as territorial claims by any state to undersea reefs. More worryingly, the US is also pressuring Australia to join its freedom of navigation exercises in the sea – a move likely to further anger China. As tensions in the South China Sea mount, it's important to understand how this dispute began and what international law says about freedom of navigation and competing maritime claims in the waters.

Militarisation of the sea

In 1982, the UN Convention on the Law of the Sea was adopted and signed, formalising extended maritime resource claims in international law. At this time, no fewer than six governments had laid claim to the disputed Paracel and Spratly islands in the South China Sea. Since then, there has been a creeping militarisation of the waters by nations seeking to secure extended maritime resource zones. In 2009, Vietnam began reclaiming land around some of the 48 small islands it had occupied since the 1970s. In response, China began its much larger reclamations on submerged features it first began to occupy in the 1980s. By 2016, these reclamations had resulted in three military-grade, mid-ocean airfields that sent shockwaves around the world, provoked in part by China breaking its own pledge not to militarise the islands.

China's claim

The South China Sea is a vast area measuring 3.6 million square kilometres, more than double the size of the Gulf of Mexico. It takes a modern warship just over three days to sail at top speed of 30 knots from its Northern edge at Taiwan to the Southern edge at the Strait of Malacca. China's claim to the sea is based both on the Law of the Sea Convention and its so-called "nine-dash" line. This line extends for 2,000 kilometers from the Chinese mainland, encompassing over half of the sea. In a historic decision in 2016, an international tribunal in The Hague ruled against part of China's claims to the sea in a case brought by the Philippines. China rejected the authority of the tribunal and its finding in the case. In its ruling, the tribunal considered the South China Sea to be a "semi-enclosed sea" as defined by the Law of the Sea Convention – a body of water tightly or largely contained by land features. This status carries with it the expectation that coastal states should cooperate on everything from conservation issues to commercial exploitation. This concept is important: it means that by definition, the South China Sea is a shared maritime space.

International law

Under the Law of the Sea Convention, all states have a right to 200 nautical mile “exclusive economic zone” to exploit the resources of the sea and seabed, as measured from their land territories. Where these zones overlap, countries are obliged to negotiate with other claimants. This has yet to happen in the South China Sea, which is the source of many of the current tensions. There are three great challenges to this. The first is the countries claiming parts of the South China Sea cannot agree who owns the Paracel and Spratly islands. China asserts its sovereignty based on highly disputable evidence from ancient times, as well as more recent claims from 1902-’39. Japan occupied the islands during the Second World War and later recognised the claim of the Republic of China, now Taiwan, in a 1952 peace treaty. Rival claimants to the islands deny the validity of this evidence. Vietnam has equally credible evidence from the period before and during the second world war. Then there is the broader question of China’s larger claim to the waters within the u-shaped “nine-dash” line. This line, which skirts the Philippines, Malaysia, Indonesia, Brunei and Vietnam, was first drawn by the Nationalist government of China in 1947. The claim had no basis in international law – then, or now. A second challenge is one of the actors in this conflict is Taiwan, which has been in dispute with China over sovereignty issues since 1949. This dispute has meant Taiwan is not formally recognised as a state by most countries and is therefore not a signatory to the Law of the Sea Convention, nor legally entitled to claim territory. But Taiwan occupies one of the islands. Third, there is a debate in international law about the type of land territory that can generate rights to an exclusive economic zone. The Law of the Sea Convention mandates the land must be able to sustain human habitation. And in 2016, the international tribunal in The Hague found no islands in the Spratly group met this criterion. This was a major blow to China’s claims to resource jurisdiction all the way to the Southern limits of the South China Sea.

Competing views

While the convention settled most international laws governing the sea, it left unresolved some issues related to military activities, especially “innocent passage” by warships in territorial seas. Under the Law of the Sea Convention, a foreign warship can pass within the 12 nautical miles of another state as long as it takes a direct route and doesn’t conduct military operations. But states disagree on what constitutes innocent passage. Maritime powers like the United States, United Kingdom and Australia routinely conduct freedom of navigation operations – or FONOPs – to challenge what Washington calls “attempts by coastal states to unlawfully restrict access to the seas.” The US has angered China by carrying out FONOPs within 12 nautical miles of the islands it claims in the South China Sea. These operations are not designed to challenge China’s claims to islands or resource zones. Rather, the purpose is to assert US rights to freedom of navigation. China opposes the transits for several reasons, including its assertion that naval ships should not “operate” in other countries’ exclusive economic zones. Beijing, however, ignores the contradiction between this position and its own activities in the sea, where its naval ships regularly operate in the claimed EEZs of other states. For their part, the smaller states of the South China Sea are ambivalent about the dispute. They are certainly opposed to what they see as bullying from China on excessive maritime claims and would like to deny

all its island claims. But they are also not keen on seeing the US go too far in its policy of intensifying military confrontation with China. Australia's statement on the South China Sea last week was its strongest rejection yet of China's claims to the waters. It did not represent a new position on the legal issues, but marked a fresh determination to confront China over its unreasonable claims and its bullying behaviour in the maritime disputes. Australia has not been keen on following the high-profile freedom of navigation operations of the US – concerned it might provoke a response from China – but that position may be about to change.

Greg Austin, Professor UNSW Canberra Cyber, UNSW. This article first appeared on The Conversation.

Source: [scroll.in](#); 29 July 2020

CHINA PRESSURIZES VIETNAM TO CANCEL, COMPENSATE OFFSHORE FIRMS OPERATING IN SOUTH CHINA SEA

- ANI

Washington DC: Amid the growing Chinese movement in the South China Sea, Vietnam has agreed to pay around a billion dollars to two international companies after cancelling their drill operations following pressure from Beijing, The Diplomat reported. To maintain its presence in the South China Sea region, China, for several years, continued its efforts to prevent the Vietnam-based companies developing oil and gas resources in the area.

Citing a well-placed oil industry source, Bill Hayton, author of the article, said, "Vietnam's state-owned energy company PetroVietnam will pay the money to Repsol of Spain and Mubadala of the United Arab Emirates in 'termination' and 'compensation' arrangements." Meanwhile, Russian energy company Rosneft has been forced to suspend its plans for drilling offshore even as China Coast Guard vessels continue operating in the area where the drilling was supposed to place. In another instance, a drilling rig standing in the Vietnamese port of Vung Tau for two months has been stood down. "Its owners, Noble Corporation, noted that the contract "includes a termination payment. This is likely to cost Vietnam several million dollars more," the author said. Similarly, Repsol, once one of the largest players in Vietnam's offshore industry and owning rights in 13 blocks of the seabed, had to cancel its planned exploration drill in July 2017 and again on March 2018.

Hayton said, "With minimal interests in China, Repsol appeared ready to withstand political pressure from Beijing. Two of its best development prospects were particularly bold: located at the far edge of Vietnam's claimed exclusive economic zone (EEZ) and well within the U-shaped, nine-dashed line drawn on Chinese maps since 1948..." Repsol executives were reportedly informed that the cancellations were a political decision, ordered by top Vietnamese leadership, following extreme pressure from China, Hayton said. The author said, "China had assembled a flotilla of 40 naval

ships off the coast of Hainan Island, about two days' sailing from the drill site, and it appeared to be ready for confrontation." As compensation for the investments made by Repsol and Mudabala, Vietnam is paying USD 800 million for their rights in the blocks and a further USD 200 million, Hayton quoted a regional oil industry source with knowledge of the settlement as saying.

"This will be a billion dollars that PetroVietnam would otherwise have paid into the Vietnamese government's budget." As China's pressure on Vietnam continues, recently, US Secretary of State Michael Pompeo said, "The United States rejects any PRC maritime claim in the waters surrounding Vanguard Bank (off Vietnam), Luconia Shoals (off Malaysia), waters in Brunei's EEZ, and Natuna Besar (off Indonesia). Any PRC action to harass other states' fishing or hydrocarbon development in these waters - or to carry out such activities unilaterally - is unlawful." Extending help to Vietnam on the matter, he said, "America stands with our South-East Asian allies and partners in protecting their sovereign rights to offshore resources, consistent with their rights and obligations under international law."

Source: freepressjournal.in; 27 July 2020

AUSTRALIA ABANDONS ITS NEUTRALITY ON THE SOUTH CHINA SEA MARITIME DISPUTES

- Carl Thayer

Australia, a state party to the United Nations Convention on the Law of the Sea (UNCLOS), has long maintained that it was neutral with respect to maritime disputes in the South China Sea. Australia's submission of a Note Verbale to the Commission on the Limits of the Continental Shelf (CLSC) on July 23 changed previous policy and came in the wake of a major change in U.S. policy made by Secretary of State Mike Pompeo 10 days earlier. Australia jumped from its perch of neutrality to align itself with the United States in supporting UNCLOS and the 2016 Award by the Arbitral Tribunal that heard the case brought by the Philippines against China. However, Australia went further and was more precise in its rejection of the legal basis of China's maritime claims in the South China Sea. For example, Australia rejected China's assertion that its sovereignty claims over the Paracel and Spratly islands were "widely recognized by the international community." Australia took note of protests by Vietnam and the Philippines to document its case. This is the first time the Paracel Islands had been mentioned in a string of Notes Verbales submitted to the CLCS since December 2019. It should be noted, however, that Australia remains neutral on various claims to sovereignty over the Paracel Islands.

Australia also expressed its "strong concern" over assertions by China that it had "continuously and effectively" exercised sovereignty over low tide elevations precisely because low tide elevations "do not form part of the land territory of a State." In line with the Award by the Arbitral Tribunal, Australia rejected China's claims to "historic rights" and went further to reject claims to "maritime rights and interests" established by "historical practice." Australia's Note Verbale commenced with a direct rejection of

“any claims by China that are inconsistent with the 1982 United Nations Convention on the Law of the Sea (UNCLOS)” particularly with respect to drawing baselines, delimiting maritime zones, and classifying features. Specifically, Australia argued that China had “no legal basis... to draw straight baselines connecting the outermost points of maritime features or ‘island groups’ in the South China Sea” with specific reference to what China calls the “four sha” – the Pratas Islands, Macclesfield Bank, the Paracel Islands, and the Spratly Islands.

Further, following the United States, Australia also rejected any claims by China to “internal waters, territorial sea, exclusive economic zone and continental shelf based on such straight baselines.” With respect to maritime zones, Australia rejected Chinese assertions to maritime zones generated by submerged features such as low tide elevations. Australia went further by specifically rejecting claims to maritime zones based on the artificial transformation of natural features. Australia declared it “does not accept that artificially transformed features can ever acquire the status of an island.”

Australia concluded its Note Verbale by calling on all claimants to clarify their maritime claims and resolve differences peacefully. Finally, Australia reserved the right to take up other aspects of claims made by China at a future time. Shortly after Pompeo’s July 13 press statement, Prime Minister Scott Morrison stated, “We back that up [Australia’s support for freedom of navigation] with our own actions and our own initiatives and our own statements but we’ll say it the Australian way, we’ll say it the way it’s in our interests to make those statements and continue to adopt a very consistent position.” This was viewed by some observers as an attempt to differentiate Australia’s approach to China from that of the United States. So what explains Australia’s change of declaratory policy? It is likely Australia quickly became aware that Pompeo’s press statement was the first salvo in an anti-China offensive by senior Trump administration officials (also including National Security Advisor Robert O’Brien, FBI Director Chris Wray, and Attorney General William Barr) that reached a crescendo on July 23 with a major speech by the secretary of state at the Nixon Library in California. Pompeo called on all free nations to summon the courage to rise as one against Chinese tyranny. It should be noted that Pompeo acknowledged there would be differences among “free nations” in his July 23 speech. He said, “Not every free nation will approach China in the same way, nor should they. Every nation will have to come to its own understanding of how to protect its own economic prosperity, and how to protect its ideals from the tentacles of the Chinese Communist Party.”

Morrison was well aware that the annual Australia-United States ministerial consultations, or AUSMIN, were scheduled for July 28. These talks include the ministers of foreign affairs and defense on both sides. On the same day that Pompeo spoke, Australia discreetly aligned its position on the South China Sea with the United States by submitting a Note Verbale to the CLCS. Australia’s Note Verbale must be placed in a broader context. On July 1, the Morrison Government released its 2020 Defense Strategic Update and 2020 Force Structure Plan. These documents, while not identifying China by name, expressed concern that “the rules-based global order is being undermined by disruptions from a widening range of sources.” In particular, Canberra warned that “The conduct of ‘grey-zone’ activities has also expanded in the Indo-Pacific. These activities involve military and non-military forms of assertiveness

and coercion aimed at achieving strategic goals without provoking conflict,” with “militarization of the South China Sea” cited as the first example.

Morrison’s comments that Australia would take “our own actions and our own initiatives” were in fact a pledge that Australia would engage more with Southeast Asia and the South Pacific. Australia’s Foreign Minister Marise Payne and Defense Minister Linda Reynolds penned a joint article in The Australian newspaper on the eve of their departure to Washington for AUSMIN. They wrote that Australia looked “to widen and deepen our friendships across the Indo-Pacific” in tandem with “our alliance with the US.” Indonesia and Vietnam are widely tipped to be priority countries.

Carl Thayer is Emeritus Professor at The University of New South Wales and Director of Thayer Consultancy.

Source: thediplomat.com; 27 July 2020

INDIAN NAVY’S CLEAR MESSAGE TO BEIJING FOLLOWING ESCALATION OF BORDER TENSION ‘REGISTERED’ BY CHINA: REPORT

- PTI

The Indian Navy’s clear message to Beijing through its aggressive deployment of almost all frontline warships and submarines in the Indian Ocean Region following escalation in the border row in eastern Ladakh has been “registered” by China, top defence sources said on Tuesday. The Indian Navy deployed a range of its frontline warships and submarines in the Indian Ocean Region(IOR) to send a clear message to China when the border tension escalated manifold in the wake of the Galwan Valley clashes on June 15.

The sources told PTI that the government adopted a multi-pronged approach involving the Army, the Indian Air Force(IAF) and the Navy as well diplomacy and economic measures to send a clear signal to China that its misadventure in eastern Ladakh was not acceptable at all. They said the three service chiefs are engaged in deliberations on almost a daily basis to ensure a coordinated approach in dealing with the situation as well as to make China understand about India’s clear message. The sources said the three services are coordinating on the military response to the border row.

The Navy has significantly expanded its deployment in the IOR deploying a plethora of warships and submarines to create pressure points on China as the maritime space around the Malacca Strait is very critical for its supply chain through sea routes. “Yes, our message has been registered by China,” said a source without elaborating. Asked whether China has responded to India’s deployment, the sources said there was no visible increase in forays by Chinese ships in the IOR. They said the reason could be the PLA Navy’s excessive deployment of resources in the South China Sea following the strong opposition by the US to Beijing’s expansive territorial claims in the region.

The US sent a number of its warships to the South China Sea to demonstrate freedom of navigation and rallying support to countries who have territorial disputes with China over the region. Asked whether China has responded to India's deployment, the sources said there was no visible increase in forays by Chinese ships in the IOR.

They said the reason could be the PLA Navy's excessive deployment of resources in the South China Sea following the strong opposition by the US to Beijing's expansive territorial claims in the region. The US sent a number of its warships to the South China Sea to demonstrate freedom of navigation and rallying support to countries who have territorial disputes with China over the region. The Army significantly enhanced deployment after the clashes in Galwan Valley that left 20 Indian soldiers dead. The Chinese side also suffered casualties but it is yet to give out the details. According to an American intelligence report, the number of casualties on the Chinese side was 35. Following the Galwan Valley incident, the government has given the armed forces "full freedom" to give a "befitting" response to any Chinese misadventure along the LAC. After the last round of military talks, government sources said the Indian side conveyed a "very clear" message to the Chinese army that status quo ante must be restored in eastern Ladakh and it will have to follow all mutually agreed protocols for border management to bring back peace and tranquillity.

Source: [hindustantimes.com](https://www.hindustantimes.com); 28 July 2020

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