The Hague Centre
for Strategic Studies

Maritime Security in a Time of Renewed Interstate Competition

Navigating the Royal Netherlands Navy through the Geopolitical and Technological Challenges and Threats in the Euro-Atlantic and Indo-Pacific Regions

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Executive summary

Interstate competition and, in extension, global and regional maritime security has returned to a position of prominence it has not occupied for decades. European naval forces declined sharply after the Cold War, de-emphasising the traditional tasks for navies and the capabilities needed to execute them. This raises questions about the current state of Dutch and European naval capabilities across a wide range of scenarios in a wide range of locations.

The Netherlands, like the rest of Europe, is confronted with pressing security challenges. The security environment in Europe has vastly deteriorated following Russia's 2022 invasion of Ukraine, while the global distribution of power is drastically shifting towards Asia, and the horizontal and vertical proliferation of missile and other technologies gives more actors easier access to better weapons. The Royal Netherlands Navy (RNLN) will thus face a series of difficult choices when it comes to future investments and strategy. This report's driving question is how the war in Ukraine and the redistribution of power towards the Indo-Pacific, and simultaneous technological trends, impact the objectives, tasks, concepts and doctrine, and thus capabilities for the RNLN and its European allies. It consists of four stand-alone, but complementary essays. They can be read separately, but together tell a coherent narrative.

The first chapter focuses on the distribution of tasks and capabilities between the Euro-Atlantic and the Indo-Pacific, and argues that, while both regions are important, the Euro-Atlantic should be the region that is prioritised. Russia is the primary threat to European security, as the February 2022 invasion of Ukraine underlined. In the maritime domain, it could threaten NATO by disrupting the movement of forces and equipment across water to reinforce Europe from the Continental US. It retains the means to target European societies and infrastructures, whether on land, on water, or under water. The prioritisation of the Euro-Atlantic produces different objectives for European navies across the world. In the Euro-Atlantic, Europe should, first, be able to protect the sea lines of communication (SLOCs) that connect it to the rest of the world, including the transatlantic SLOC to the US, and those that go through the Mediterranean and Black Sea towards the Red Sea. Second, Europeans need to protect the land-based parts of the SLOC to ensure the resupply of NATO in Europe during a crisis, as well as other fixed targets that would be essential during a conflict. Third, Europeans need to protect their territories and armed forces, including ports, infrastructure, and command and control, from the Russian conventional missile threat, and Anti-Access Area Denial (A2/AD) capabilities.

China presents a security challenge for Europe and to states across the Western Pacific. From a European perspective, its activities undermine the freedom of the seas in maritime transport routes that connect Asian economies to Europe, and are crucial for global trade. Unlike the naval tasks required in the Euro-Atlantic to face the Russian threat, the challenges in the Indo-Pacific have less straight-forward military solutions; moreover, Europeans, including France and the UK, lack the capacity to provide credible military deterrence there. In the Indo-Pacific, alongside other Europeans, the RNLN can, first, protect the SLOCs from lower-intensity security threats including piracy and terrorism, focusing on the Red Sea and the Persian Gulf. This would also send a signal to regional states that Europe is willing to contribute to the multilateral order in the wider Indian Ocean. Second, Europeans can increase their naval presence in the Indo-Pacific subregions to signal support for the freedom

of the seas in the Indo-Pacific, and to stress the importance of legal dispute settlement mechanisms such as the United Nations Convention on the Law of the Sea (UNCLOS). This can be achieved through bilateral, minilateral and multilateral arrangements involving European and Indo-Pacific navies. Third, the RNLN, alongside other Europeans, can increase their naval presence in the Western Pacific to reassure key allies such as Japan and Australia.

The second chapter explores the key technological developments that affect navies, specifically the decreasing survivability of surface ships due to the proliferation of 'ship-killer' missiles, the transparency of the oceans stemming from the marked increase in sensors, and the possibilities for unmanned vessels. Important as developments in each of these areas are, it is the combination of missile and unmanned attacks from various directions against targets more easily identified by enhanced ISR which will likely have the greatest impact.

The first technological development the chapter looks at is the missile threat to surface vessels from anti-ship missiles (AShMs). The proliferation of these weapons is characterised by improvements in both quality and arsenal size, which increasingly poses a risk to the U.S. Navy's largely uncontested command of the maritime domain. These systems are increasingly enabled by marked improvements in sensors and data processing which allows for faster and more precise targeting. The largest proliferation of missile technology has been observed in the Indo-Pacific region. Nearer to Europe, Russian and Iranian developments deserve closer attention, as well as non-state actors like the Houthis. What is apparent is that AshMs present a powerful means to deny access in areas like the Strait of Hormuz, the Baltic Sea and the Black Sea, the South China Sea, where European commercial and naval activity takes place. For technologically advanced European navies, such as the Dutch, there is the opportunity to build asymmetric advantages in missile defence through targeted investments in electronic warfare systems.

Secondly, unmanned navel vehicles (UNV) are having an impact on naval forces around the world. Such vehicles operating underwater, on the surface, and in the air have been able to enhance intelligence collection, stealthily approach critical targets, and overwhelm the air defence systems of naval vessels. These relatively cheap and easily concealable platforms will likely make frequent appearances on battlefields around the world in coming years and will in particular pose risks to vessels in port as well as port facilities themselves. Given the importance of the major European ports Rotterdam, Bremerhaven, and Antwerp in NATO strategy, defence against this threat may represent a major role for European maritime forces. Russia and China have invested in UNV technology. Iran has made dedicated efforts to intercept U.S. unmanned maritime vehicles, potentially with the aim of replicating the technology. With equal investments from the US and its allies, the Western Pacific will be increasingly populated with unmanned craft below, on, and above the surface.

Finally, increased sensing and data fusion capabilities have vastly changed the scope of maritime situational awareness and understanding. The growing transparency of what is happening on the seas and oceans is caused by the nexus of three technologies: cheaper Unmanned Underwater Vehicles (UUV), improvements in machine learning and big data analysis tools to make better use of existing data, and the proliferation of aerial drones and open-source commercial satellite imagery. This has raised concern amongst some experts that the survivability of Western states' sea-based nuclear deterrent is at risk from these new applications. However, it is not yet exactly clear what scale and type of impact such technology will have, particularly as it will inevitably lead to a race between measures and countermeasures.

The third chapter looks at how the essential role that the seas and oceans play in military and commercial transport can be secured. Transatlantic and global SLOCs remain important to European security and prosperity, and vulnerable to external threats. Traditional SLOC and maritime chokepoint protection is becoming a more difficult task. Threats stemming from submarines, missile proliferation, unmanned vehicles, and cyber-attacks complicate the ability of European navies to ensure SLOC protection into the future. Generally, 80% of NATO's area of responsibility is in the maritime space, which means that vast amounts of ocean have to be monitored. Conversely, SLOC and sea control disruption can be achieved fairly asymmetrically, as chapter 2 underlined in its discussion of AshM and unmanned vehicles. Global shipping and naval operations are dependent on highly networked systems that are vulnerable to attack before ships are even put to sea. Ports have been increasingly subjected to cyber-attacks that disrupt operations to shipping and the risk of China's ownership of port facilities has been continuously raised by senior military commanders. Disruption at a single chokepoint can cause significant second-order effects to global maritime mobility.

Today, with a potentially higher willingness to bear costs, Russian naval and air forces could be used against NATO SLOCs in the event of war. The threat stems mainly from the Northern Fleet, and potentially the Pacific Fleet. Europe could then draw on several solutions to defend unencumbered passage across the Atlantic. Improved Anti-Submarine Warfare (ASW) by enhanced seabed-to-space sensing can decrease the ability of Russian submarines to operate unseen as they try to pass through the GIUK (Greenland-Iceland-UK) gap or even as they leave the northern bastion. This includes technical solutions such as the U.S. navy's Deep Reliable Acoustic Path Exploitation System (DRAPES), an improved submarine detection array, and NATO's 'digital ocean' programme which has the longer-term ambition of creating an Internet-of-Things for the ocean that can connect a larger number of sensors to greater data processing capacities. Beyond this, and assuming U.S. involvement in operations, NATO maintains a preponderance of maritime power in the Atlantic with the capability to deploy nuclear powered attack submarines (SSNs) and carrier strike groups to degrade Russian capabilities. A potential naval fight in the Baltic Sea would certainly present a more constrained geographic area for naval forces, but this is largely offset by the numerical superiority of NATO airpower in the region as well as over-lapping missile systems between the alliance and Russia. For the RNLN there are two clearly identifiable roles. First is to contain Russian surface and subsurface forces within the GIUK gap and engage them within the Norwegian and Arctic seas. The second is for the Dutch Marines to support NATO forces in the Arctic and Baltic as they target Russian forces.

The Western Pacific SLOC challenge is fundamentally different than in the Euro-Atlantic. In the case of a Russia/NATO conflict, the challenges and respective trade-offs are based on the Atlantic SLOCs and the Russian Arctic SSBN bastion being geographically separate. In the Pacific, particularly the South China Sea, the SLOC and the bastion are co-located, particularly with the Longpo Naval Base on the southern coast of Hainan Island. SLOC protection then, either implicitly or explicitly, risks the misperception that forces are being routinely deployed that can directly challenge China's SSBNs. While NATO, the EU, and individual European states now take a greater interest in the Indo-Pacific region, SLOC protection in the Western Pacific for European navies makes little sense. The US, regional states, and China itself have their own interests in maintaining maritime trade routes and SLOCs in the Western Pacific, while European states will be called upon to supply their assets in the Euro-Atlantic theatre. Furthermore, European navies face the risk of becoming overstretched. For the RNLN, this means a balance between maintaining and modernising existing surface vessels, namely its frigates, and assuring sufficient quantity and capability for *Walrus*-class submarines and their planned replacements. Importantly, an emphasis on interoperability and

frequent engagement with allied and partner maritime forces will allow for a more seamless role for the navy in broader multinational efforts.

The fourth chapter, building on the second chapter, examines how amphibious forces can maintain their mobile advantages in today's operational environment. The vertical and horizontal proliferation of mobile land-based, longer-range, more precise missiles and unmanned vessels now complicate attempts at amphibious landings. Especially longer ranged land-based aShM with enough range to threaten vast swathes of sea space hundreds of miles from the nearest shore pose great challenges. China, for instance, has massively invested in this capability to create A2/AD bubbles aimed at preventing the American Navy from operating close to the Chinese shore. Taiwan is developing similar capabilities.

While large-scale amphibious operations will become more difficult in the future, the need to deploy reinforcements by sea remains, both between the US and Europe and within the European theatre. The vulnerability of the Baltic States is one of NATO's main concerns. NATO has only deployed limited forward forces, relying on a deterrence by punishment approach and a surge of reinforcements. In the case of a conflict, amphibious capability might very well be needed to reinforce the Baltic States that have few ports. The Finnish Gulf would then become a central arena of confrontation. The Norwegian Sea and the Arctic are further regions of concern. In both the Baltic Sea and the High North, larger brigade and division sized amphibious operations are both highly vulnerable and other capabilities make them largely redundant.

Renewed interstate competition, moreover, has the potential to further fuel the many (intra-state) wars raging in Africa and the Middle East while most military resources are now reoriented to deal with the direct Russian threat from the East. Along the Mediterranean, the Red Sea, the Persian Gulf and the shores of Africa, 'sea soldiers' offer operational planners a vital and versatile tool. Ships operating in these seas will need a level of protection comparable to what is needed against Russia, or risk becoming vulnerable in case of escalation. The vulnerability of amphibious ships is further increased by their complement of amphibious troops, making them a tempting target for an opponent looking to produce the greatest number of casualties and achieve maximal political impact with an attack.

To maintain appropriate amphibious landings capabilities, more flexible operating concepts and faster shore connectors are necessary. For European forces, including the RNLN, clear priorities lie in raiding, counterterrorism, anti-piracy operations and humanitarian response in the NATO area and of national territory outside of Europe in a supportive role . A realistic solution for the RNLN is to downscale its ambitions from large scale amphibious operations in order to focus on raiding from the sea, using its Marines both as a striking force on its own and as part of a wider reconnaissance-strike complex. There is a need for highly trained light infantry and flexible amphibious ships. The Royal Netherlands Marine Corps, finally, offers NATO forces an important tactical, operational and strategic multi-domain capability that is not wedded to the amphibious domain.

Recommendations. Across the respective topics covered in the four essays, there is a clear need to balance between the various ambitious political objectives, missions, naval tasks, capabilities, and regional commitments that have been made. The topics covered in the essays are comprehensive, but not exhaustive. Together, the chapters paint a picture that underlines the urgent need for adaptations to an increasingly challenging environment. The Royal Netherlands Navy should:

1. Continue to build on its multinational approach, both through bilateral and minilateral collaborations with its NATO allies, as well as through bilateral, minilateral, and multilateral collaborations with its Indo-Pacific partners.
2. Prioritise the protection of the maritime approaches to Europe with which it maintains access to the United States and to the threatened NATO member states, and to the Red Sea and Gulf; practically this means that the NATO Euro-Atlantic region comes first, the Western Indian Ocean second, and then everything else.
3. Invest in ASW assets, particularly submarines, maritime patrol aircraft (MPA) and UUVs/USVs, that can contribute to the network of NATO sensors across the Euro-Atlantic Area and diminish the reliance on American ISR capabilities, particularly in the GIUK gap and the North Sea; Invest in general-purpose frigates to conduct patrols in the Western Indian Ocean or Persian Gulf area and to ensure SLOCs between the Indo-Pacific region and Europe can remain open.
4. Invest heavily in defensive measures against aShMs, particularly in electronic warfare countermeasures, to overcome adversary's denial capabilities. Where possible, this should be explored as joint projects within the closest defence partnerships, particularly Germany, the UK, France, and Belgium, to ensure interoperable shipboard systems; this includes experimenting with both electronic and physical deception measures and tools and routinely exercise counter-detection manoeuvres. Where possible, work with industry to understand the level of development of civilian-owned satellite imagery and maritime sensors to ensure shipboard tools can be updated to keep pace with industrial developments.
5. Find space and invest in experiments that integrate UUVs, USVs, and UAVs into both LIVEXs and routine naval manoeuvres. Incorporating such experimentation into longer cruises both inside and beyond the Euro-Atlantic area would be a way to combine activities and maximise both the realism of experiments and resource efficiency.
6. Invest in marine forces that can contribute to multinational amphibious task groups across NATO and the EU's areas of responsibility, while maintaining a robustness to deploy independently to areas of Dutch responsibility (e.g., the Caribbean); organise to optimise for raiding and reconnaissance, and to deliver units from the ship to shore with connectors; Invest in connectors with long range and high speed to allow for stand-off capability in denial-heavy areas; Invest in amphibious ships with the speed and the range to operate as part of fast battlegroups.

Introduction
Where are we and how did we get here

Interstate competition, and with it interstate maritime security, has returned to a position of prominence it has not occupied for decades, perhaps not since the end of the Second World War. There is thus a greater need for a wide range of naval capabilities from the Royal Netherlands Navy (RNLN) - and its European counterparts - across a wide range of scenarios in a wide range of locations. The RNLN, like its European partners, and the Dutch armed forces in general, as well as political leaders, face uncomfortable questions about which missions, capabilities, and regions to prioritise given the limited means they currently possess.

European navies went into serious decline following the end of the Cold War

European navies went into serious decline following the end of the Cold War, as European involvement in peer-to-peer naval warfare was deemed unlikely after the collapse of the Soviet Union. Consequently, European naval capabilities shrank.[1] This decline can be expressed in different ways: the number of overall ships; the decline of heavier classes; and their onboard offensive and defensive capabilities. During the so-called Global War on Terror (GWOT), security demands were primarily centred on the land domain. After all, in the post-Cold War environment, the United States had command of the global maritime commons, which meant it could deny access to the world's oceans to any potential adversaries, while those adversaries could not do the same to the US.[2] That ability to access and deny access meant that the US had a unique ability to project power and move forces across the planet. It demonstrated this capability in the First Gulf War when it moved and sustained the forces needed to eject Iraq from Kuwait.[3] It could ensure this type of access for allies as well. Moreover, even during the Cold War, Europeans had obviously been focused on land- and air-warfare in the European theatre, rarely needing to project power further abroad. The 1982 Falklands War was the obvious example, at least for the British.

The key consequence of the three-decade pause in concern about high-intensity maritime security issues is that European militaries have de-emphasised the traditional tasks for navies and the capabilities needed to execute them. These tasks included traditional warfighting activities – against near-peer or peer competitors – and deterrence; moving large-scale forces to, between and within regions; enforcing access into contested zones; and large-scale sea denial. These high-intensity tasks were deemed less crucial for Europeans since the US was expected to take care of them. Instead, throughout the 1990s, 2000s, and 2010s, European navies played a greater role in maritime law enforcement, through anti-piracy actions specifically, which intertwined with the larger set of tasks from the war on terror. These included multinational missions on the Western coasts of Africa, the Red Sea, and the

1 Jeremy Stöhs, *The Decline of European Naval Forces* (Naval Institute Press, 2018).

2 Barry R. Posen, "Command of the Commons: The Military Foundation of US Hegemony," *International Security* 28, no. 1 (2003): 5–46.

3 Michael E. O'Hanlon, *The Science of War: Defense Budgeting, Military Technology, Logistics, and Combat Outcomes* (Princeton University Press, 2013), 141–68.

Persian Gulf. Today, only the French and British navies have all the capabilities needed to fight at the highest-intensity levels and all European navies lack in numbers of ships. This weakness becomes even more pronounced if the demands for operating at the other side of the world are taken into account. Only the UK and France have the nuclear powered attack submarines (SSN) that are the key sea denial and Anti-Submarine Warfare (ASW) platforms of modern naval warfare. And only the UK and France have the aircraft carriers (respectively two and one) suitable for long-range, fixed-wing air strikes needed for power projection. Only they have deployed sea-launched long-range cruise missiles. Beyond the number of ships among European navies, their offensive and defensive capabilities are also lacking. Using a basic metric of the number of Vertical Launch System (VLS) cells as a benchmark for the offensive and defensive capabilities of a ship, Jeremy Stöhs shows that European navies have 2328 VLS cells compared to the nearly 9000 VLS cells of the US. Moreover, the U.S., Chinese, and Russian navies, respectively, have12000, 5200 and 3000 Battle Force Missiles (BFM).[4] A metric that perhaps would have seemed irrelevant in an era in which the daily threat was from Somali pirates, but not one in a so-called era of great power competition.

Yet the Netherlands, like the rest of Europe, is now confronted with a vastly deteriorated regional security environment in Europe following Russia's 2022 invasion of Ukraine, while the global distribution of power is drastically shifting towards Asia.[5] With the rise of China, the US has become more and more focused on the Indo-Pacific,[6] yet its ability to rapidly and securely reinforce Europe across the Atlantic is a key building block of credible conventional deterrence by NATO Europe. The waters remain the key facilitator of the movement of commercial and military goods and people,[7] and the protection of maritime transport routes and sea lines of communication (SLOC) thus has regained significance.[8]

At the same time, the nature of naval warfare has undergone a further evolution, potentially heralding an era of persistent maritime denial due to growing and improving missile arsenals with which ships and land-based infrastructure can be targeted.[9] The aforementioned capacity shortfalls are thus even more worrying, because they are taking place in an era of widespread horizontal and vertical proliferation of missile technology, with more actors in possession of better weapons. Therefore, as a consequence of improvements in sensing, targeting, and precision strikes, the surface of the sea has become less and less survivable. China in particular has invested in so-called Anti-Access Area Denial (A2/AD) capabilities to raise the costs of U.S. power projection in its vicinity. It has invested in a series of missiles, ranging from ballistic missiles unrestricted by the Intermediate Nuclear Forces (INF) Treaty in operation between the US and Russia until 2019. With the DF-21 ballistic missile, China

4 Jeremy Stöhs, "How High? The Future of European Naval Power and the High-End Challenge" (Djøf Publishing, 2021), 39, https://cms.polsci.ku.dk/publikationer/hvor-hoejt-fremtiden-for-europaeisk-maritim-militaermagt-og-udfordringen-fra-stigende-kapacitetstaerskler/CMS_Report__2021_1_-_How_High_-_The_Future_of_European_Naval_Power__updated_15_FEB_2021_.pdf.

5 Koninklijke Nederlandse Marine, "Sail Plan Vooruit!" (Koninklijke Nederlandse Marine, May 2023), 5.

6 Department of Defense, *Fact Sheet: 2022 National Defense Strategy* (Washington D.C: Department of Defense, 2022); Joseph R. Biden, "Interim National Security Strategic Guidance," March 3, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/03/interim-national-security-strategic-guidance/; Jim Mattis, "National Defense Strategy of the United States of America" (Washington D.C.: Department of Defense, 2018); Paul Van Hooft, "All-in or All-out: Why Insularity Pushes and Pulls American Grand Strategy to Extremes," *Security Studies* 29, no. 4 (2020).; Mark Manyin, *Pivot to the Pacific? The Obama Administration's "Rebalancing" Toward Asia* (Washington, D.C.: Congressional Research Service, 2012).

7 Ian Speller, *Understanding Naval Warfare*, 2nd ed. (Second edition. | Abingdon, Oxon ; N.Y., NY : Routledge, [2019]: Routledge, 2018), 17, https://doi.org/10.4324/9781315227818.

8 Benedetta Girardi, Paul Van Hooft, and Giovanni Cisco, "What the Indo-Pacific Means to Europe: Trade Value, Chokepoints, and Security Risks" (The Hague, Netherlands: Hague Centre for Strategic Studies, 2023).

9 Jonathan D. Caverley and Peter Dombrowski, "Cruising for a Bruising: Maritime Competition in an Anti-Access Age," *Security Studies* 29, no. 4 (2020): 671–700.

can target U.S. air bases and ports, up to Guam. With the DF-26, the much-vaunted so-called "carrier killer", China can target U.S. carriers.[10] The point here, of course, is to blunt the U.S. ability to project naval and especially air power into China's vicinity during a war over Taiwan or in the South China Sea. However, Russia and Iran, among others, have also invested in these capabilities.[11] Tables 1 and 2 show the number of ballistic missiles to target both land and sea targets, as well as the anti-ship missiles, of China, Russia, and Iran. Beyond raising the costs for access, they also increase the challenges of forceful entry by U.S. or allied land forces through amphibious operations. Simultaneously, the subsurface environment has also changed as increased sensor capabilities have made it more and more transparent. Within these changing surface and subsurface contexts, the role of unmanned vehicles, whether to cross dangerous surfaces to deliver supplies, or to carry containers full of missiles, or especially to contribute to the swath of sensors, has grown and is likely to continue to do so. The RNLN will thus face a series of difficult choices when it comes to future investments, which will need to emphasise survivability and deception as much as striking power.

The report takes these geopolitical and technological developments into account; it looks to clarify the uncomfortable questions about which missions, capabilities, and regions to prioritise. The report's driving question is how the war in Ukraine and the redistribution of power towards the Indo-Pacific, and the simultaneous technological challenges will impact the objectives, tasks, concepts and doctrine, and thus capabilities for the RNLN and its European allies. It consists of four stand-alone, but complementary essays. They can be read separately, but together tell a coherent narrative.

The first chapter focuses on the distribution of tasks and capabilities between the Euro-Atlantic and the Indo-Pacific, highlighting the clear military threat in the former, and the larger challenge in the latter. It argues that Dutch and European efforts should be primarily focused on Europe and the maritime approaches to Europe in the Euro-Atlantic, including the Mediterranean and Red Sea, where vital interests are at stake. After this, the focus should be on the Western Indian Ocean. Yet, European navies can play a signalling role in the broader Indo-Pacific. The second chapter explores the key technological developments that affect navies, specifically the decreasing survivability of surface ships, the transparency of the oceans, and the possibilities for unmanned vessels. It particularly underlines the threats emanating from these new technologies, which require adaptation in approaches; to understand both the threats and opportunities, the chapter makes a case for more experimentation. The third chapter looks at how the essential role that the oceans and seas play in military and commercial transport can be secured. This chapter notes that the transatlantic SLOCs remain vulnerable, but also those further away from Europe are important to both European security and prosperity. Building on the second chapter, the fourth chapter examines how amphibious forces can maintain their mobile advantages in a less survivable environment, emphasising the importance of more flexible operating concepts and faster shore connectors to overcome the challenges of hostile coasts. Together, these essays paint a picture that underlines the urgent need for adaptations to an increasingly challenging environment.

10 Stephen Biddle and Ivan Oelrich, "Future Warfare in the Western Pacific: Chinese Antiaccess/Area Denial, U.S. AirSea Battle, and Command of the Commons in East Asia," *International Security* 41, no. 1 (2016): 7–48; Eva Braden Montgomery, "Contested Primacy in the Western Pacific: China's Rise and the Future of U.S. Power Projection," *International Security* 38, no. 4 (2014): 115–49; Sam Tangredi, *Anti-Access Warfare: Countering Anti-Access and Area-Denial Strategies* (Naval Institute Press, 2013); Paul Van Hooft, "Don't Knock Yourself Out: How America Can Turn the Tables on China by Giving up the Fight for Command of the Seas," *War on the Rocks*, February 23, 2021.

11 Robert Dalsjö, Michael Jonsson, and Christofer Berglund, "Bursting the Bubble? Russian A2/AD in the Baltic Sea Region: Capabilities, Countermeasures, and Implications" (FOI, March 2019).

1. Threats and Challenges: Distribution of naval responsibilities in the Euro-Atlantic and the Indo-Pacific

Paul van Hooft

The re-emergence and intensification of major interstate competition in both Europe and Asia has not only increased the demand for high-intensity capabilities for European navies, including the Royal Netherlands Navy (RNLN), but also increased demand across a greater geographic reach. Given the demands on European militaries to counter Russia's threat in the NATO area and the maritime approaches to Europe in the wake of Russia's invasion of Ukraine, but also keeping China's growing power in Asia in mind, how should they distribute their limited naval capacity between the Euro-Atlantic and Indo-Pacific regions?

The chapter underlines that the RNLN should prioritise its military role in the Euro-Atlantic, given the Russian threat to European territories and the SLOCs that connect Europe to the US, and be prepared for high-intensity warfare. Yet, the navy should also be able to perform certain military tasks in the Indo-Pacific, given the strategic interests at stake in the various subregions. In the Indo-Pacific, the Western Indian Ocean should be the next priority for the RNLN, specifically the Red Sea with the Strait of Bab el Mandeb and the Persian Gulf with the Strait of Hormuz, to ensure that these maritime routes remain open for trade and military transport. This subregion is where European navies can most effectively use their capabilities and European vital interests are most directly at stake. Further east, where the Indian Ocean and the Pacific Ocean meet, as well as in the Western Pacific, a Dutch naval presence is better suited to send a political signal that strategic interests are at stake in the region; however, other instruments of statecraft are more appropriate to ensure these interests. That said, the RNLN has an explicitly multinational approach which is applicable not only to its NATO obligations in the Euro-Atlantic, but also to its interests across the Indo-Pacific with European and regional allies and partners. In short, different interests are at stake in different subregions, requiring different military and diplomatic approaches, with different navies.

The RNLN should prioritise its military role in the Euro-Atlantic

The chapter's approach depends on three questions, each following from the previous. The first is an assessment of the objectives to be achieved in the respective regions, which defines the naval tasks required. The objectives require political choices. Any potential European engagement is not primarily a military one, but requires a wide range of tools of statecraft; these are choices at the level of grand strategy and thus require political-military integration as well as coordination between the Ministries of Defence, Foreign Affairs, and Economic Affairs. The second is the assessment of naval tasks. There are serious differences between

deterrence and warfighting, or sea control and denial on the one hand, and law enforcement, humanitarian, or other tasks on the other hand.[12] The objectives for each region, as well as the overall capacity, shape the naval tasks. Depending on the kind of objectives for each region, entirely different tasks emerge. The third is the assessment of the capabilities and multinational frameworks needed to achieve those respective objectives and tasks; in an era where high-intensity confrontations are no longer unlikely, objectives and tasks must match. Doing otherwise in a highly competitive environment is inviting disaster. The overall assessment depends on what the Netherlands – and other Europeans – deem vital interests for which they must then possess the capabilities, or strategic interests for which they would prefer to have the capabilities.

The sections below discuss the primary threats and challenges in the Euro-Atlantic and the Indo-Pacific, which objectives, tasks, and capabilities are needed in the respective regions, and then how to adjudicate between them.

Re-emergence of major interstate competition in Europe and Asia

Russia is the primary threat to European security, as the February 2022 invasion of Ukraine has underlined. It has the conventional and nuclear capabilities to threaten European societies, the proven revanchist intentions to recast the post-Cold War order in Europe, and presents a consistent hybrid threat through its interference in politics, influence operations and disinformation campaigns across Europe.[13] The primary military domains in which Russia presents a conventional threat to NATO / European territorial integrity are on land and from the air, the latter specifically through missiles. Its threat to maritime security, however, is still significant because NATO is dependent on moving forces and equipment across water, specifically to reinforce Europe from the Continental United States (see the discussion in chapter 3). Moreover, the Russian nuclear threat depends in large part on its missile submarines, including for the delivery of its low-yield, so-called "tactical" nuclear weapons.[14] As Russia leans ever more heavily on nuclear coercion, and should be expected to continue to do so after the losses suffered by its conventional forces and the weakened or absent threat from the energy weapon, the risks posed at sea from ballistic missile submarines will likely increase.

However, China is the primary challenge to global security, and presents a military threat to states across the Western Pacific. This specifically includes those states and actors that it has territorial disputes within the South China Sea –Vietnam, Philippines, Brunei, Malaysia,

12 Speller, *Understanding Naval Warfare*, 169. Geoffrey Till suggests a variety of tasks for a navy from policing duties like fishery protection to conducting expeditionary operations in a high-intensity environment. Geoffrey Till, *Seapower: A Guide for the Twenty-First Century* (Routledge, 2018), 149. Ken Booth, *Navies and Foreign Policy* (Abington, Oxon: Routledge, 2014), 15. Jonathan Masters, "Sea Power: The U.S. Navy and Foreign Policy," Council on Foreign Relations, August 19, 2019, https://www.cfr.org/backgrounder/sea-power-us-navy-and-foreign-policy. Peter Trevor Haydon, Sea Power and Maritime Strategy in the 21st Century: A" Medium" Power Perspective (Centre for Foreign Policy Studies, 2000). Speller, *Understanding Naval Warfare*, 115. Jeremy Stöhs, How High? The Future of European Naval Power and the High-End Challenge (Kobenhavn: Djof Publishing ; In cooperation with Centre for Military Studies, 2021), 61. Booth, *Navies and Foreign Policy*, 20–21.

13 Keith Crane, Olga Oliker, and Brian Nichiporuk, *Trends in Russia's Armed Forces: An Overview of Budgets and Capabilities*, Research Report, RR-2573-A (Sant Monica, Calif: RAND Corporation, 2019); David Shlapak and Michael Johnson, *Reinforcing Deterrence on NATO's Eastern Flank: Wargaming the Defense of the Baltics* (RAND Corporation, 2016), https://doi.org/10.7249/RR1253; Alexander Lanoszka, "Russian Hybrid Warfare and Extended Deterrence in Eastern Europe," *International Affairs* 92, no. 1 (2016): 175–95.

14 Kristin Ven Bruusgaard, "Russian Nuclear Strategy and Conventional Inferiority," *Journal of Strategic Studies* 0, no. 0 (October 14, 2020): 1–33, https://doi.org/10.1080/01402390.2020.1818070.

and Taiwan – and in the East China Sea – Japan.[15] In the South China Sea, these claims particularly focus on the land features of the Paracel Islands, the Spratly Islands chain, and the Scarborough reef/shoal.[16] Moreover, China claims Taiwan as a runaway province. These disputes are driven by a wide range of reasons, including prestige, economic interests such as energy resources and fishing populations, and military exigencies. China has built artificial islands across the South China Sea. These can further blunt U.S. power projection by expanding A2/AD bubbles. The People's Liberation Army Navy (PLAN) and the PLA's Rocket Force has built up a set of capabilities, including YJ-12B and YJ-62 anti-ship cruise missiles, and specifically DF-21D Medium-Range Ballistic Missiles,[17] with which to target ships. Moreover, the Chinese People's Liberation Army Navy (PLAN) uses so-called hybrid or grey zone tactics with military exercises or paramilitary vessels to intimidate, harass, and coerce the vessels of neighbouring states.[18] Crucially, from a European perspective, China's threats to other Western Pacific states not only undermine the regional and global order, they also undermine the freedom of the seas in key sea lines of communication that connect Asian economies to Europe. These are arguably the most important waterways for global trade, and include the South China Sea, the East China Sea, and the Strait of Taiwan, to chokepoints like the Strait of Malacca, Strait of Lombok, and so on.[19]

Finally, any European distribution of naval tasks between the Euro-Atlantic and the Indo-Pacific must take into account that the Indo-Pacific arguably begins at Djibouti and, at least technically, includes the eastern coasts of Africa, and stretches to the Western coasts of the Americas. The Euro-Atlantic and Indo-Pacific meta-regions, however, hinge in the maritime area between the eastern Mediterranean to the Western Indian Ocean, passing through the Suez Canal and the Red Sea, meaning the Strait of Bab-el-Mandeb. At its eastern edges, the Indian Ocean in turn hinges through the Southeast Asian chokepoints to the Western Pacific. This creates a series of subregions that cover the entire length of the sealines of communication that connect Europe to East Asia and should be covered in the definition of the Indo-Pacific applicable for the RNLN. Different challenges threaten each of these regions and the chokepoints located alongside them; from piracy and terrorism in the Red Sea and the Gulf, to climate-related risks and the threat of great power war in the Strait of Malacca and the South China Sea and East China Sea.[20]

15 "Maritime Claims of the Indo-Pacific," Asia Maritime Transparency Initiative, accessed March 7, 2023, https://amti.csis.org/maritime-claims-map/.

16 Shuxian Luo, "Provocation without Escalation: Coping with a Darker Gray Zone," *Brookings* (blog), June 20, 2022, https://www.brookings.edu/opinions/provocation-without-escalation-coping-with-a-darker-gray-zone/; Benjamin J. Sacks, "The Political Geography of the South China Sea Disputes: A RAND Research Primer" (RAND Corporation, October 2022), 23, https://www.rand.org/pubs/perspectives/PEA2021-1.html.

17 BBC News, "South China Sea: What's China's Plan for Its 'Great Wall of Sand'?," *BBC News*, July 14, 2020, sec. Asia, https://www.bbc.com/news/world-asia-53344449.

18 Alexander Lott, *The Implications of Hybrid Threats to the Maritime Domain* (Brill Nijhoff, 2022), 3 ff., https://doi.org/10.1163/9789004509368_002; Brahma Chellaney, "China's Global Hybrid War," The Strategist, December 9, 2021, https://www.aspistrategist.org.au/chinas-global-hybrid-war/; Kunal Sharma, "How China Uses Geoengineering to Pursue a Hybrid Warfare Strategy," The Diplomat, January 31, 2023, https://thediplomat.com/2023/01/how-china-uses-geoengineering-to-pursue-a-hybrid-warfare-strategy/; Gisela Grieger, "China Tightens Its Grip over the South China Sea," *European Parliamentary Research Service*, February 2021, 1–2; Luo, "Provocation without Escalation."

19 Paul van Hooft and Tim Sweijs, "Why Should Europe Guard the Indo-Pacific Maritime Commons: Order, Access, or US Hegemony?," Europe in the Indo-Pacific Hub (The Hague: The Hague Centre for Strategic Studies, September 2023), https://hcss.nl/wp-content/uploads/2022/02/Guarding-the-Maritime-Commons-HCSS-2022.pdf; Girardi, Van Hooft, and Cisco, "What the Indo-Pacific Means to Europe: Trade Value, Chokepoints, and Security Risks."

20 Girardi, Van Hooft, and Cisco, "What the Indo-Pacific Means to Europe: Trade Value, Chokepoints, and Security Risks."

Euro-Atlantic: countering the Russian threat

Given the re-constituted Russian threat to European security, there are three objectives that Europeans should be able to achieve in the Euro-Atlantic.

First, Europeans should be able to protect the sea lines of communication (SLOCs) that connect Europe to the rest of the world. This includes both the transatlantic SLOC that connect Europe to the US, and those that go through the Mediterranean and Black Sea towards the Red Sea. This includes ensuring the continued readiness of NATO's Standing Maritime Groups (SNMGs) and contributions to Operation *Sea Guardian* in the Mediterranean. As chapter 3 discusses in depth, the transatlantic SLOCs are crucial for the credibility of NATO's deterrence. Anti-submarine warfare (ASW) capabilities are thus vital .

Europeans should be able to protect the sea lines of communication that connect Europe to the rest of the world

The latent potential of the Russian threat to NATO sea lines remains present, even though Russia until now has not exhibited the intention to threaten them, or lacked the capabilities. Regardless, existing Russian capabilities do have the potential to be used to threaten shipping across the transatlantic SLOC. In the twentieth century wars, these SLOC presented serious vulnerabilities to allied efforts. The First Battle of the Atlantic during the First World War was essential to maintain the connection between Britain and France and the rest of the world. Imperial Germany's attacks on transatlantic shipping ended up bringing the US into the war. During the Second World War, the Second Battle of the Atlantic in which German submarine wolfpacks hunted the Atlantic proved a serious strain on Allied resources and hindered the supply of essential goods to the British war effort.[21] That potential continues to exist. Russian submarines could emerge from their bastions in the High North to threaten ships passing through the Greenland-Iceland-UK (GIUK) gap in the northern Atlantic. NATO ASW capabilities would be needed to counter those, and ensure that the Russian submarines stay out of the Atlantic shipping lanes that NATO forces would use. They could also accomplish other goals.[22] Still, investments in technologies that increase the transparency of the ocean, as discussed in chapter 2, could ensure that Russian submarines are pushed further back.

Second, Europeans need to protect the land-based parts of the SLOC to ensure the resupply of NATO in Europe during a crisis, as well as other fixed targets that would be essential during a conflict. Russian submarines could attack ports, infrastructure, and command and control nodes in Western Europe with conventional weapons such as the Kalibr cruise missile.[23] Russian submarines could launch these weapons from the far north, further from Western Europe than Norway is.[24] European ASW capabilities for sea denial can ensure that the Russian submarines are pushed back far from the ranges they need to launch at Europe.

21 Jonathan Dimbleby, *The Battle of the Atlantic: How the Allies Won the War* (Oxford University Press, 2016).

22 During the Cold War, the so-called Third Battle of the Atlantic was primarily focused on the two superpowers finding each other's Strategic Ballistic Missile Submarines (SSBN). Owen R. Cote Jr, "The Third Battle," 2003. In the 1980s, the United States Navy looked to pressure the Soviet SSBNs and to force them to use their attack submarines for protection. However, this was a strategy that risked inadvertent nuclear escalation. Linton F. Brooks, "Naval Power and National Security: The Case for the Maritime Strategy," *International Security* 11, no. 2 (1986): 58–88. Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks*, 2014 edition (Cornell University Press, 1991).

23 Katarzyna Zysk, "Escalation and Nuclear Weapons in Russia's Military Strategy," *The RUSI Journal* 163, no. 2 (2018): 7; Steve Wills, "'These Aren't the SLOC's You're Looking for': Mirror-Imaging Battles of the Atlantic Won't Solve Current Atlantic Security Needs," *Defense & Security Analysis* 36, no. 1 (2020): 30–41; Maren Garberg Bredesen and Karsten Friis, "Missiles, Vessels and Active Defence: What Potential Threat Do the Russian Armed Forces Represent?," *The RUSI Journal*, 2020, 70–71; Dmitry Dima Adamsky, *Moscow's Aerospace Theory of Victory: Western Assumptions and Russian Reality* (Washington: CNA, 2021), 6.

24 Bredesen and Friis, "Missiles, Vessels and Active Defence," 68.

Chapter 2 further discusses the difficulties of surviving an age of vertical and horizontal proliferation of missiles.[25]

Third, Europeans need to protect their territories and armed forces from the Russian conventional missile threat. Air- and missile defence capabilities to counter the Russian conventional missile threat from both submarines and land-based launchers are needed. This includes the threats to ports, infrastructure, and command and control mentioned above. However, air and missile defence capabilities are also needed to counter Russia's A2/AD capabilities, such as the K-300 Bastion-P coastal defence system and ship-based Kalibr anti-ship cruise missiles, with which it hopes to deny NATO reinforcements to the Baltics during a crisis.[26] From a European perspective, ship-based air and missile defence has the advantages of greater mobility and thus fungibility for allied defence and deterrence. While the primary threat is conventional, improved air and missile defences also counter the Russian ability to coerce Europe with medium-range, so-called "tactical" nuclear weapons.[27] Moreover, these RNLN assets are likely to be needed to protect the ever-expanding infrastructure in the North Sea from conventional attacks.

There are no inherent contradictions between these three objectives for the Euro-Atlantic. The RNLN can contribute to both the air and missile defence and ASW tasks with its frigates and submarines.

The discussion of the Euro-Atlantic has primarily focused on the Atlantic Ocean, North Sea, and Baltic Sea; however, it also includes the Mediterranean and the Black Sea. Demands for naval presence in the latter are likely to increase if and when Turkey feels itself so threatened by Russia that it demands NATO support. The Mediterranean is particularly crucial as it is the first link in the chain that connects Europe to Asia and Africa

Indo-Pacific: managing the Chinese challenge

Given the challenge of China, the growing economic weight of Asia, and the risks of escalation of the Sino-American competition, there are three objectives that Europeans can consider achieving in the Indo-Pacific.

First, Europeans can protect the Indo-Pacific SLOC and maritime transport routes from lower-intensity security threats including piracy and terrorism. The emphasis here would be on the Red Sea and the Persian Gulf. It would build on the European Union maritime missions EMASOH in the Strait of Hormuz and ATALANTA off the Horn of Africa and the Western Indian Ocean. This region and these routes also include the energy resources that Europe relies on, and maritime security there therefore constitutes a strategic interest. The European naval presence would not only serve a direct security function, but also send a signal to

25 See also: Paul Van Hooft and Lotje Boswinkel, "Surviving the Deadly Skies: Integrated Air and Missile Defence 2021-2035" (The Hague, Netherlands: The Hague Centre For Strategic Studies, December 2021).

26 Eric S. Edelman and Whitney Morgan McNamara, *U.S. Strategy for Maintaining a Europe Whole and Free* (Centre for Strategic and Budgetary Assessments, 2017). David A. Shlapak and Michael Johnson, *Reinforcing Deterrence on NATO's Eastern Flank* (RAND, 2016), https://www.rand.org/pubs/research_reports/RR1253.html. Dalsjö, Jonsson, and Berglund, "Bursting the Bubble? Russian A2/AD in the Baltic Sea Region: Capabilities, Countermeasures, and Implications," March 2019, 26.

27 Paul Van Hooft, Davis Ellison, and Tim Sweijs, "Pathways to Disaster: Russia's War against Ukraine and the Risks of Inadvertent Nuclear Escalation" (The Hague, Netherlands: Hague Centre for Strategic Studies, 2023).

regional states about the European willingness to contribute to order in the wider Indian Ocean. Moreover, European contributions to security in the Western Indian Ocean could diminish the pressure on the U.S. Navy, which could focus on the Western Pacific. The threats in the Red Sea, including Bab el Mandeb, and the Persian Gulf, including the Strait of Hormuz, cover the entire range from non-state to state actors. To tackle the threat of non-state groups such as pirates and terrorists, the marine corps will need to maintain amphibious capabilities, as chapter 4 explains further.

Second, Europeans can increase their naval presence in the Indo-Pacific subregions to signal support for the multilateral order and the freedom of the seas in the Indo-Pacific, and to stress the importance of legal dispute settlement mechanisms such as the United Nations Convention on the Law of the Sea (UNCLOS).[28] This would be in line with the Indo-Pacific statements from Europe's key maritime powers, the UK and France,[29] as well as Germany, the Netherlands,[30] and the EU itself.[31] A European naval presence would not serve a primarily military purpose, but instead underline the importance Europeans attach to existing institutions. It should be pursued in combination with the diplomatic, legal, trade, investment, and capacity-building tools as part of a whole of government approach. Key regional middle powers including Japan, South Korea, Australia, Indonesia, as well as India, have welcomed greater European engagement with the region.[32] However, this objective would be particularly aimed at the states that are hesitant about becoming directly involved in the Sino-American competition due to their high economic dependency on China, particularly the states in South and Southeast Asia. To signal European and Dutch support for a multilateral maritime order, their naval presence should be coordinated through a series of bilateral, minilateral, or multilateral frameworks; the coordination *between* European navies presents a strong signal of shared European interests at stake, while the coordination *with* Indo-Pacific navies presents a strong signal of joint preferences for a multilateral order based on maritime law that small and middle powers in Europe and Asia share with each other.

Europeans can increase their naval presence in the Indo-Pacific subregions to signal support for the multilateral order and the freedom of the seas in the Indo-Pacific

28 Naval presence sends a signal of state interests. Ian Speller, *Understanding Naval Warfare*, 2nd ed. (Second edition. | Abingdon, Oxon ; N.Y., NY : Routledge, [2019]: Routledge, 2018), 83 . Colin S. Gray, *The Leverage of Sea Power: The Strategic Advantage of Navies in War* (Free Press, 1992), 2; Speller, *Understanding Naval Warfare*, 25. *Kevin Rowlands, Naval Diplomacy in the 21st Century: A Model for the Post-Cold War Global Order* (Routledge, 2018). *Christian Le Mière, Maritime Diplomacy in the 21st Century: Drivers and Challenges* (Routledge, 2014).

29 "France and Security in the Indo-Pacific," Ministère des Armées, May 2019, https://franceintheus.org/IMG/pdf/France_and_Security_in_the_Indo-Pacific_-_2019.pdf. "France's Defence Strategy in the Indo-Pacific" (Paris: Ministère des Armées, 2019), 16. Though the British statement is not a dedicated policy document, it discusses the tilt to the region extensively. "Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy" (HM Government, March 2021), 67 .

30 Policy Guidelines for the Indo-Pacific," August 2020, 23–26. "Indo-Pacific: Guidelines for Strengthening Dutch and EU Cooperation with Partners in Asia" (Government of the Netherlands, November 2020).

31 "Council Conclusions on an EU Strategy for Cooperation in the Indo-Pacific" (Council of the European Union, April 16, 2021). "The EU Strategy for Cooperation in the Indo-Pacific" (European Commission, September 16, 2021), 2.

32 Satoshi Sugiyama, "As Europe's Interest in the Indo-Pacific Grows, Is Japan Ready to Lead the Way?," *The Japan Times*, May 18, 2021, https://www.japantimes.co.jp/news/2021/05/18/national/japan-europe-indo-pacific-leadership/. Garima Mohan, "Where Does Europe Fit in India's Indo-Pacific Policy?," Sasakawa USA, March 21, 2022. "Jaishankar: Distance No Insulation, Challenges in Indo-Pacific Could Extend to Europe: Jaishankar," *Economic Times India Times*, February 22, 2022, https://economictimes.indiatimes.com/news/defence/distance-no-insulation-challenges-in-indo-pacific-could-extend-to-europe-jaishankar/articleshow/89748145.cms. Rory Medcalf, "Antipodean Entente: Optimising Australia and Europe's Indo-Pacific Partnership," in *Europe's Indo-Pacific Embrace: Global Partnerships for Regional Resilience* (Konrad-Adenauer-Stiftung, 2021). Susannah Patton, "Australia's Views of Europe in Indo-Pacific: Potential for Balance," *Sasakawa USA*, February 25, 2022, https://spfusa.org/wp-content/uploads/2022/08/Susannah_Patton_Australias-Views-of-Europe-in-Indo-Pacific.pdf. Kiki Verico, "How Indonesia Sees the Indo-Pacific Economic Architecture," *The National Bureau of Asian Research (NBR)* (blog), November 6, 2021, https://www.nbr.org/publication/how-indonesia-sees-the-indo-pacific-economic-architecture/.

Third, Europeans can increase their naval presence to signal their support for the freedom of the seas in the Indo-Pacific, and to deter revisionist threats to a free and open Indo-Pacific, particularly in the Western Pacific. The focus of this objective is to deter China and to reassure key allies such as Japan and Australia. The European operations of the past years, including the 2021 British-led multinational carrier group that included Dutch and American vessels, and the French-led carrier group, with Greek and Belgian ships,[33] were intended to send that signal. The EU's High Representative has suggested making European naval presence in the Taiwan Strait a feature in the future as well.[34] However, the limits of European military capabilities would ensure that this is a risky course of action; they would hardly survive direct involvement in a Sino-American military confrontation. Moreover, other regional states are looking for Europeans to dampen the chances of such a confrontation. Using European ships for deterrence can only achieve limited effects; due to highly constrained European naval capacity, it is obvious that no additional military assets can be supplied. If a European naval presence is intended to serve as a tripwire for European involvement, at best this involvement would take the form of European economic warfare measures against China, including sanctions and export controls. The more powerful signal Europeans, including the Dutch, can send, would be directed at supporting the order in the other sections of the Indo-Pacific, particularly the Western Indian Ocean.

Unlike the naval tasks required in the Euro-Atlantic to face the Russian threat, the challenges in the Indo-Pacific have less straight-forward military solutions and they are not complementary to the same degree. Attempting to deter China would be beyond the military credibility that European navies can provide so far from home.[35] The Royal RNLN could instead consider focusing on maritime law enforcement contributions across the Indian Ocean and South East Asia to send a signal of support for the multilateral order, and focus on potential higher-intensity tasks in and near the Persian Gulf and Red Sea. For the former, offshore patrol boats would arguably suffice, for the latter, the future frigates make a substantial contribution.

33 George Allison, "British Carrier Strike Group to Sail through South China Sea," UKDJ, April 28, 2021, https://ukdefencejournal.org.uk/british-carrier-strike-group-to-sail-through-south-china-sea/; Frank Gardner, "China Warns UK as Carrier Strike Group Approaches," *BBC News*, July 29, 2021, sec. Asia, https://www.bbc.com/news/world-asia-58015367; Xavier Vavasseur, "French Carrier Strike Group Begins 2021 Deployment," USNI News, February 23, 2021, https://news.usni.org/2021/02/23/french-carrier-strike-group-begins-2021-deployment.

34 "Taiwan Strait: Top EU Diplomat Calls for European Navy Patrols | Taiwan | The Guardian," accessed April 25, 2023, https://www.theguardian.com/world/2023/apr/23/taiwan-strait-top-eu-diplomat-calls-for-european-navy-patrols?CMP=share_btn_tw.

35 Paul van Hooft, Benedetta Girardi, and Tim Sweijs, "Guarding the Maritime Commons: What Role for Europe in the Indo Pacific," Guarding the Commons (The Hague: The Hague Centre for Strategic Studies, February 2022), chap. 5, https://hcss.nl/wp-content/uploads/2022/02/Guarding-the-Maritime-Commons-HCSS-2022.pdf.

Conclusions

European navies have regained importance following the re-emergence of competition between great powers in both Europe and Asia. Navies have essential military tasks to fulfil, and can also be used as powerful and highly mobile signals of a state's interests being at stake. The recommendations are thus:

Navies have essential military tasks to fulfil, and can also be used as powerful and highly mobile signals of a state's interests being at stake

1. Protecting European territories, armed forces, and the maritime approaches to and from Europe from the Russian threat is the key priority, from the perspective of both a proximate submarine and missile threat and of where European capabilities can be deployed most effectively. In the Euro-Atlantic, ASW against Russian submarines that can threaten the transatlantic SLOCs is essential; as is protecting the port infrastructures other land-based targets against missiles through IAMD. For the RNLN, submarines and helicopters, together with the ASW frigates expected to enter service in 2029, as well as air defence frigates thus remain key assets. The military contribution of European navies, including the RNLN, in the Indo-Pacific is limited outside of the Western Indian Ocean, specifically the Persian Gulf and the Red Sea. Given European interests in energy supplies and trade, as well as wider concerns about stability between regional states, and their limited capacity, this would be an obvious priority for naval operations by the Dutch and other Europeans navies outside of the Euro-Atlantic area.
2. While European navies offer limited use in a potential military confrontation between the US and China in the Western Pacific;, they are, however, useful for signalling the importance that Europeans attach to freedom of the seas and non-military forms of dispute settlements. In the Indo-Pacific context, the role of European navies, including the RNLN, should be subsidiary to larger diplomatic and economic measures aimed at strengthening the existing multilateral order.[36] The actual naval tasks in the Indo-Pacific would be more focused on anti-piracy, counterterrorism, and law enforcement tasks in which the Dutch and other European navies can show the flag, with the potential for higher-intensity warfighting tasks near the Red Sea and the Gulf. Multi-role frigates could perform some of these tasks, but offshore patrol vessels would suffice.
3. Third, the RNLN should consider its role in a multinational context. In the Euro-Atlantic, this is obviously through NATO. In the Indo-Pacific, a series of bilateral, minilateral, and multilateral frameworks with European allies and regional Indo-Pacific partners would be needed both to meet the demands for capacity, as well as to underline the larger political and diplomatic goals of the Dutch naval presence in the region.

36 van Hooft and Sweijs, "Why Should Europe Guard the Indo-Pacific Maritime Commons: Order, Access, or US Hegemony?"

2. Dangerous Waters: Contextualising maritime technological trends for the post-Ukraine War world

Davis Ellison

As part of an enhanced NATO and European Union focus on the Indo-Pacific region, European navies have increased their deployments of surface ships to the area.[37] These increases come at a time of markedly higher tension between China and the US. Much of this tension is centred on military-technological changes which are part of China and the U.S. seeking to respectively expand or maintain their spheres of influence in the Indo-Pacific. 'Ship-killer' missiles, unmanned vehicles, and a marked increase in sensors are means with which this rivalry is being pursued at sea. This is putting new premiums on both the effectiveness of defensive systems and on building up capacities in a variety of naval platforms, and presents a technological challenge that the Dutch and other European navies must deal with.

The Moskva was the largest warship to be sunk in combat since the Falklands War

In the second month of Russia's invasion, the Black Sea flagship *Moskva* was sunk after being struck by two Ukrainian-made R-360 'Neptune' anti-ship missiles. The *Moskva* was the largest warship to be sunk in combat since the Falklands War. The naval aspect of this war has included, among other elements, the large use of missiles and combined use of airborne and maritime drones to harass naval assets both at sea and in port.[38] Altogether, the experience of the Russian Black Sea fleet has been a dangerous one, likely in ways that were not anticipated in Moscow or in many other capitals.

These battlefield developments imply a possible shift in maritime technology away from large, vulnerable surface platforms and towards an emphasis on a massive amount of data collected by many sensors that can constantly feed information to a wide array of strike assets. One of the most impactful is the potential 'transparency of the oceans,' where a combination of cheap sensors and large strides in data processing are being combined to render submarines vulnerable to detection and tracking, eliminating a key refuge for technologically advanced forces. A review of scientific and strategic literature conducted by the Australian National University found that the general professional and scholarly consensus is that it is 80% likely that the oceans will be transparent by 2050.[39] This trend is controversial, however, and

37 William R. Hawkins, "NATO Navies Send Strategic Signals in the Indo-Pacific," *Proceedings* 148, no. 8 (2022), https://www.usni.org/magazines/proceedings/2022/august/nato-navies-send-strategic-signals-indo-pacific.

38 Bill Combes, "The War at Sea," Brief, Russia's War in Ukraine (Tallinn: International Centre for Defence and Security, June 2022), https://icds.ee/wp-content/uploads/dlm_uploads/2022/06/ICDS_Brief_Russia%C2%B4s_War_in_Ukraine_No6_Bill_Combes_June_2022.pdf.

39 Roger Bradbury et al., "Transparent Oceans? The Coming SSBN Counter-Detection Task May Be Insuperable" (Canberra: Australian National University National Security College, 2020), https://nsc.crawford.anu.edu.au/publication/16666/transparent-oceans-coming-ssbn-counter-detection-task-may-be-insuperable.

debates continue about how 'transparent' they may actually become and what it will ultimately mean for operations.

Assessments of the maritime domain have generally posited that it has become a much more dangerous area in which to operate, both above and below the surface.[40] The developments explored in detail below should be understood in the strategic context in which they are being pursued. Choices in military investments carry with them an image of the conflict in which they could be used. Russia's heavy investment in missile technologies can be understood in the context of its plans to target critical infrastructure as part of a broader campaign while also buttressing the credibility of its nuclear second-strike capability.[41] Important to consider is how these capability areas can be combined to achieve more lethal effects, rather than highlight the detailed characteristics of any one system. This chapter will not only consider the choices adversaries have made, but also seek to explain why they were made within the context of strategies and operational approaches.

Nearly all of Russia's military modernisation since 2008 has been pursued with NATO as a baseline. That Russia's capabilities at sea have been degraded due to Ukrainian attacks has not dislodged the Black Sea fleet from a position of maritime superiority, as its blockade and missile strikes launched at sea continue. This naval balance could prove decisive as Russia seeks to maintain its ability to coerce Ukraine and its backers.[42] For NATO navies, especially in Europe, Russia's navy remains a potential threat. Beyond this, the Chinese and Iranian navies have continued to expand both vertically (in terms of capability, especially in unmanned systems) and horizontally (in sheer numbers), and are incorporated into explicit strategies to threaten vital maritime commons on which sea lines of communication to Europe depend. This proliferation implies a renewed look at the assumptions underpinning Dutch and European naval strategy as explored in chapter one above.

This short chapter will consider each of the three areas identified above in turn: the modernisation and proliferation of anti-ship missiles, improvements in unmanned vehicles, and developments in sensing and detection, and consider the strategic contexts in which they have been used or are being developed, particularly in relation to the inter-regional dynamics discussed in chapter one. The general conclusion is that the nearly uncontested position of naval superiority enjoyed by NATO states since the end of the Cold War has ended and stresses an invigorated focus on naval operations in contested areas, both on the open ocean and in littoral areas.

The Proliferation of 'Ship-Killers'

The threat to surface vessels from anti-ship missiles (AShMs) is hardly new. In the 1980s, both the Falklands War and the 'Tanker War' that occurred during the wider Iran-Iraq War showed the vulnerabilities of both naval forces and commercial shipping to missile threats. Indeed, since 1945 at least 35 military and commercial ships have been sunk after being struck by a

40 Sidharth Kaushal, "Conference Report: RUSI Sea Power Conference 2022," 2022, https://static.rusi.org/352-CR-SeaPower-web-final.pdf.

41 Michael Kofman, Anya Fink, and Jeffrey Edmonds, "Russian Strategy for Escalation Management: Evolution of Key Concepts," Research Memorandum (Arlington, VA: Center for Naval Analyses, April 2020), https://www.cna.org/reports/2020/04/DRM-2019-U-022455-1Rev.pdf.

42 Daniel Fiott, "Relative Dominance: Russian Naval Power in the Black Sea," War on the Rocks, November 9, 2022, https://warontherocks.com/2022/11/relative-dominance-russian-naval-power-in-the-black-sea/.

missile, the vast majority being commercial ships targeted by air-launched AShMs during the Iran-Iraq War.[43]

Though the risk has persisted for years, modern analyses have raised the profile of the missile threat to surface vessels. This has included a particular focus on 'carrier-killer' missiles[44] that are perceived to pose a risk to the U.S. Navy's largely uncontested command of the maritime domain. An increased risk perception is primarily due both to the vertical proliferation (qualitative improvements) in such missiles, and their horizontal proliferation (arsenal size). The Russian 3M22 Tsirkon (NATO reporting SS-N-33) can reportedly travel at Mach 8 speed[45], making many NATO surface vessels vulnerable as their deployed interceptor missiles are not yet able to match this velocity. Outside of NATO/EU states, Russia, China, and India have each tested and reportedly fielded to some extent such hypersonic AShMs.[46] Importantly, these systems are increasingly enabled by marked improvements in sensors and data processing which allows for faster and more precise targeting.[47]

The Indo-Pacific region has seen the largest proliferation of missile technology, much of which is driven by the U.S.-China rivalry

The Indo-Pacific region has seen the largest proliferation of missile technology, much of which is driven by the U.S.-China rivalry. China has aggressively pursued a large, advanced arsenal of conventional precision strike missiles as part of a strategy of strategic substitution against the US, with the aim of countering Washington's nuclear deterrent as well as increasing the risk to the U.S. bases and fleets in the region.[48] South Korea has pursued an independent conventional strike programme out of fear of U.S. abandonment in the event of a war with North Korea.[49] The US has worked to catch up with China through new concepts such as the Marine Corps' Expeditionary Advanced Base Operations (EABO) concept, which plans to arm Marines on shore with AShMs to control littoral areas in the Western Pacific.[50] However, Washington appears to be finding few friends in the region willing to host new missile systems, with long-standing allies such as Australia, the Philippines, and Japan signalling the political difficulties in doing so.[51]

43 Martin S. Navias and E.R. Hooton, *Tanker Wars: The Assault on Merchant Shipping During the Iran-Iraq Conflict, 1980-1988*, vol. 6, Library of International Relations (London: I.B. Tauris Publishers, 1996).

44 Charles Clover, "China Parades 'Carrier-Killer' Missile through Beijing," *Financial Times*, September 3, 2015, https://www.ft.com/content/b94d907a-507a-11e5-b029-b9d50a74fd14.

45 MDAA, "3M22 Zircon – Missile Defense Advocacy Alliance," Missile Defense Advocacy Alliance, 22, accessed January 12, 2023, https://missiledefenseadvocacy.org/missile-threat-and-proliferation/todays-missile-threat/russia/3m22-zircon/.

46 John T. Watts, Christian Trotti, and Mark J. Massa, "Primer on Hypersonic Weapons in the Indo-Pacific Region" (Washington, D.C.: Atlantic Council, August 2020), https://www.atlanticcouncil.org/wp-content/uploads/2020/08/Hypersonics-Weapons-Primer-Report.pdf.

47 Douglas Barrie, "Trends in Missile Technologies," International Institute for Strategic Studies, March 11, 2019, https://www.iiss.org/blogs/analysis/2019/03/trends-in-missile-technologies.

48 Fiona Cunningham, "Strategic Substitution: China's Search for Coercive Leverage in the Information Age," *International Security* 47, no. 1 (2022): 46–92.

49 Ian Bowers and Henrik Stålhane Hiim, "Conventional Counterforce Dilemmas: South Korea's Deterrence Strategy and Stability on the Korean Peninsula," *International Security* 45, no. 3 (January 1, 2021): 7–39, https://doi.org/10.1162/isec_a_00399.

50 Art Corbett, "Expeditionary Advanced Base Operations (EABO) Handbook: Considerations for Force Development and Employment" (U.S. Marine Corps Warfighting Lab, Concepts & Plans Division, June 1, 2018), https://mca-marines.org/wp-content/uploads/Expeditionary-Advanced-Base-Operations-EABO-handbook-1.1.pdf.

51 Jeffrey W. Hornung, "Ground-Based Intermediate-Range Missiles in the Indo-Pacific: Assessing the Positions of U.S. Allies" (Santa Monica, CA: RAND Corporation, 2022).

In AShMs specifically, Beijing has developed a range of capabilities, including the YJ family (the YJ-21 being hypersonic), the HD-1, and the Xingkong-2.[52] Some missiles with a potential anti-ship mission but not developed for hypersonic speeds are reportedly capable of enhancement via the DF-ZF hypersonic glide vehicle (HGV).[53] In ballistic missiles alone, CSIS estimated in 2021 that China possessed between 980 and 2118 short-, medium-, and intermediate-range ballistic missiles, a number which has almost certainly increased in the intervening years. This also does not include those surface-to-surface systems that with refitting could be assigned an anti-ship role. These are all envisaged as part of a campaign to target U.S. and allied surface ships at sea and port in the event of a war, with the overall effect of disrupting the systems-dependent approach of Western-style forces.[54] These also present a significant threat to European navies, with consequences for which tasks they should consider in the Indo-Pacific region, as chapter 1 notes.

The loss of a single capital ship to an AShM would have an outsized impact

Closer to European waters, missile proliferation and battlefield use has increased with both Russia and Iran developing a suite of anti-ship capabilities with similar aims of reducing the ability of European forces to operate, as well as the U.S. navy. There has been little use of AShMs by either Russia or Iran in recent years despite the liberal use of land-attack cruise and ballistic missiles in both the war against Ukraine and Iranian operations against U.S. forces in Iraq. During the current Russo-Ukrainian war, there has been limited use of AShMs by Ukraine outside of the *Moskva* sinking, with an additional strike reportedly being against the port of Berdyansk.[55] This is generally unsurprising however given the relatively small size of the Ukrainian Navy and the comparative dominance of the Russian Black Sea Fleet over the course of the war.[56] Nevertheless, given the smaller size of Dutch and other European navies, the loss of a single capital ship to an AShM would have an outsized impact.

Importantly, AShM systems will become increasingly susceptible to electronic warfare defences. 'Soft kill' measures have grown in effectiveness, particularly when it comes to electronic interference in guidance systems. Many of the more complicated manoeuvres claimed by hypersonic enthusiasts are more difficult to achieve against a sophisticated EW suite. For example, the 'pop-up' manoeuvre that hypersonic weapons would perform as they near a target, briefly allowing the weapon to evade hard-kill interception measures, is not assured when the granularly timed manoeuvre is interfered with. For technologically advanced European navies, such as the Dutch, there is the opportunity to build asymmetric advantages in missile defence through targeted investments in electronic warfare systems.

52 Paul Bernstein and Dain Hancock, "China's Hypersonic Weapons," *Georgetown Journal of International Affairs* (blog), January 27, 2021, https://gjia.georgetown.edu/2021/01/27/chinas-hypersonic-weapons/; Dennis M Gormley, Andrew S Erickson, and Jingdong Yuan, "Assessing Chinese Cruise Missile Developments," *Joint Force Quarterly* 75 (2014); Zachary Williams, "Takeaways From China's Zhuhai Air Show 2022," The Diplomat, November 21, 2022, https://thediplomat.com/2022/11/takeaways-from-chinas-zhuhai-air-show-2022/.

53 Mike Yeo, "China Unveils Drones, Missiles and Hypersonic Glide Vehicle at Military Parade," Defense News, October 2, 2019, https://www.defensenews.com/global/asia-pacific/2019/10/01/china-unveils-drones-missiles-and-hypersonic-glide-vehicle-at-military-parade/.

54 Jeffrey Engstrom, "Systems Confrontation and System Destruction Warfare: How the Chinese People's Liberation Army Seeks to Wage Modern Warfare" (RAND Corporation, February 1, 2018), https://www.rand.org/pubs/research_reports/RR1708.html; Paul van Hooft and Lotje Boswinkel, "Surviving the Deadly Skies: Integrated Air and Missile Defence 2021-2035" (The Hague: The Hague Centre for Strategic Studies, November 2021), https://hcss.nl/wp-content/uploads/2021/12/Integrated-Air-and-Missile-Defense-HCSS-Dec-2021.pdf.

55 H.I. Sutton, "Satellite Images Confirm Russian Navy Landing Ship Was Sunk at Berdyansk," USNI News, March 25, 2022, https://news.usni.org/2022/03/25/satellite-images-confirm-russian-navy-landing-ship-was-sunk-at-berdyansk.

56 Fiott, "Relative Dominance: Russian Naval Power in the Black Sea."

This is not to be dismissive of the role of AShMs in the European theatre or in the Persian Gulf. Missiles have come to play a central role for the Russian navy. The relative success of sea-launched cruise missile attacks in destroying Ukrainian infrastructure could well reinforce this importance. There is an important messaging role as well. In early January 2023, Russia deployed and postured a Gorshkov-class frigate armed with Tsirkon missiles in the Atlantic, an implicit threat to European forces.[57] Given that the 2022 Russian maritime doctrine places the confrontation with NATO at the centre of its Atlantic posturing, the deployment of Tsirkons speaks to the role Russia has assigned to such missiles in its military thinking about NATO; this would likely include threats to SLOCs across the Atlantic as well as being able to threaten the alliance from the west as well as the east. Iran is still able to seriously threaten shipping across the entire Persian Gulf.[58] What is apparent is that AShMs give states a particular power in controlling their own littoral areas such as the Black Sea and the Straits of Hormuz. That these are areas where heavy European commercial and naval activity takes place warrants serious attention as to the ability of these vessels to operate freely in the event of a crisis or war.

Unmanned Vehicles

Unmanned naval vehicles (UNVs) are having an impact on naval forces in both this current conflict and more broadly around the world. UNVs operating underwater, on the surface, and in the air have been able to enhance intelligence collection, stealthily approach critical targets, and overwhelm the air defence systems of naval vessels. They have been areas of particular investment not only for NATO/EU states and their partners, but also for Russia[59] and China.[60] Iran has also made dedicated efforts to intercept U.S. unmanned maritime vehicles, potentially with the aim of replicating the technology.[61] They have also been highlighted by the U.S. maritime services as playing an important role in sustaining forces in contested areas where normal logistics systems would struggle to operate.[62]

Unmanned underwater vehicles (UUVs), on which more will be explored below in the context of anti-submarine warfare, have a wide potential range of applications. Previous research by RAND has identified seven roles for which UUVs are most suitable: mine countermeasures, sensor placement, harbour monitoring, oceanographic research, undersea infrastructure monitoring, submarine tracking, and inspections.[63] There is clearly breadth for consideration, though one can be highlighted based on events during the current war. The role of undersea infrastructure monitoring for UUVs will remain and increase in importance considering the

57 Guy Faulconbridge, "Putin Deploys New Zircon Hypersonic Cruise Missiles to Atlantic | Reuters," Reuters, January 4, 2023, https://www.reuters.com/world/europe/putin-sends-off-frigate-armed-with-new-hypersonic-cruise-missile-2023-01-04/.

58 van Hooft and Boswinkel, "Surviving the Deadly Skies: Integrated Air and Missile Defence 2021-2035."

59 "Первое в России Беспилотное Научно-Исследовательское Судно Спустили На Воду в Санкт-Петербурге," Government, Ministry of Science and Higher Education of the Russian Federation, September 24, 2022, https://www.minobrnauki.gov.ru/press-center/news/nauka-i-obrazovanie/40391/.

60 Kristin Huang, "China Showcases Never before Seen Range of Unmanned Maritime Vehicles at Zhuhai Air Show," South China Morning Post, November 13, 2022, https://www.scmp.com/news/china/military/article/3199399/china-showcases-never-seen-range-unmanned-maritime-vehicles-zhuhai-air-show.

61 "Iran Forced to Return US Sail Drones Seized at Sea for Second Time | US News," The Guardian, September 2, 2022, https://www.theguardian.com/us-news/2022/sep/02/iran-forced-to-return-us-sail-drones-seized-at-sea-for-second-time.

62 "Advantage at Sea: Prevailing with All-Domain Naval Power" (U.S. Department of the Navy, December 2020), 23, https://media.defense.gov/2020/Dec/16/2002553074/-1/-1/0/TRISERVICESTRATEGY.PDF.

63 Robert W. Button et al., "A Survey of Missions for Unmanned Undersea Vehicles | RAND" (Santa Monica, CA: RAND, 2009), https://www.rand.org/pubs/monographs/MG808.html.

sabotage conducted against the Nord Stream pipelines in September 2022.[64] Though culpability has not yet been fully assigned, such monitoring could relieve future investigations of attribution problems by persistently observing critical undersea infrastructure such as pipelines and communications cables.

Such systems have been another area of focussed military-industrial activity for China. In 2022, it introduced a 'drone carrier', the Zhu Hai Yun, capable of carrying unmanned surface, underwater, and aerial vehicles. Notionally for scientific research, it has also been highlighted as a particularly significant addition to China's naval intelligence capabilities.[65] Overall Chinese investments in both the quality and quantity of these platforms will allow for more capable long-range strike targeting, which is central to China's push to threaten the U.S. bases that dot the Pacific, for a more persistent presence in disputed territories at sea, and for a greater capacity to export these systems to other states.[66] With equal investments from the US and its allies, the Western Pacific will be increasingly populated with unmanned craft below, on, and above the surface.

The Western Pacific will be increasingly populated with unmanned craft below, on, and above the surface

In terms of combat applications for unmanned systems, the October 2022 Ukrainian raid on the port of Sevastopol is the archetype. A combined sea and airborne attack using 'suicide' drones targeted surface vessels of the Russian Black Sea fleet and reportedly damaged several vessels, but did not seriously damage Russian assets.[67] Perhaps the greatest effect was in reminding both participants and observers of the vulnerability of previously untouchable 'rear areas' in conflicts. The use of unmanned systems for raiding purposes was not entirely novel. Referred to by some as the 'poor man's air force', UAVs have been used frequently in the Syrian Civil War, with both anti-Assad rebels and IS making use of them to strike targets such as Russian forces based at the port in Tartus.[68] These relatively cheap and easily concealable platforms will likely make frequent appearances on battlefields around the world in coming years and will pose particular risks to vessels in port as well as port facilities themselves. Given the importance of the major European ports Rotterdam, Bremerhaven, and Antwerp,in NATO strategy, defence against this threat could be a major role for European maritime forces.

There are important differences, however, between the combat uses seen in Ukraine and the development of such systems by states in peacetime. There are, for example, a number of regulatory differences that prohibit the testing of fully autonomous systems. The U.S. Navy's Task Force 59, an experimental unit testing unmanned systems, has been based in Bahrain rather than the US in order to avoid such restrictions. Space for testing is also highly congested, particularly in Europe. There simply is not enough air and maritime space to go around in order to do experimental use. This is not to bely what can be learned from the Ukraine war, though the difference in contexts must be recognised.

64 Julian Bolger, "Nord Stream Attacks Highlight Vulnerability of Undersea Pipelines in West | Nord Stream 1 Pipeline | The Guardian," September 29, 2022, https://www.theguardian.com/business/2022/sep/29/nord-stream-attacks-highlight-vulnerability-undersea-pipelines-west.

65 Prakash Panneerselvam, "Unmanned Systems in China's Maritime 'Gray Zone Operations,'" The Diplomat, January 23, 2023, https://thediplomat.com/2023/01/unmanned-systems-in-chinas-maritime-gray-zone-operations/.

66 Michael S. Chase et al., "Emerging Trends in China's Development of Unmanned Systems" (Santa Monica, CA: RAND Corporation, March 12, 2015), https://www.rand.org/pubs/research_reports/RR990.html.

67 Hugo Bachega and James Gregory, "'Massive' Drone Attack on Black Sea Fleet - Russia," BBC News, October 29, 2022, https://www.bbc.co.uk/news/world-europe-63437212.

68 Nick Waters, "The Poor Man's Air Force? Rebel Drones Attack Russia's Airbase in Syria," Bellingcat, January 12, 2018, https://www.bellingcat.com/news/mena/2018/01/12/the_poor_mans_airforce/.

Transparent Oceans

Expert opinion has coalesced around the idea that the oceans will be 'transparent' by 2050. But what technology is enabling such an eventuality and what does it mean for subsurface forces? And transparency for whom? The general trend is that increased sensing and the fusion of data, as also seen in the case of missile deployments, has vastly changed the scope of what data collection and processing means in the maritime space.

The growing transparency of the oceans is caused by the nexus of three technologies: cheaper UUVs, improvements in machine learning and big data analysis tools to make better use of existing data, and the proliferation of aerial drones and open-source commercial satellite imagery.[69] These three areas reinforce one another and are each developing at significant pace. Their combined impact is to make anti-submarine warfare (ASW) easier by increasing the number of sensors and the ability to process the data collected from them. Each area, however, merits brief exploration in turn.

UUVs offer a cheap, mobile platform from which to collect ASW data. In complement with existing assets like sonobuoys and seabed sensors, they can enhance collection capacity without generating significant extra cost. For example, smaller, more numerous UUVs each carrying a single hydrophone and operating at different depths can enhance overall collection capacity. Such assets could also surface and act as non-acoustic data relays between bottom arrays and ASW aircraft, thus reducing the overall time required for information gathering that contributes to the overall laboriousness of ASW.[70]

Data processing has also taken significant strides in recent years. In particular, the application of quantum physics to data processing has made the detection, analysis, integration and diagnosis of separate data sets much easier by allowing the storage and analysis of larger amounts of information while using less energy.[71] At sea, this can be applied to running sophisticated oceanographic models in real time or to sifting through the vast amount of underwater noise to detect submarine signatures faster.[72] This has raised concern amongst some experts that the survivability of Western states' sea-based nuclear deterrent is at risk from these new applications.[73] In short, quantum processing is going to exponentially increase the efficiency of ASW detection methods. Importantly, however, timelines for the full development and application of more sophisticated quantum-based computing and sensing remain quite long, with some expert opinion projecting ten years or more. Finally, despite state funded efforts to compete in this space, industry will almost certainly outpace government-led efforts.[74] It is simply not yet clear exactly what scale and type of impact such technology will have, particularly as it will inevitably lead to the creation of countermeasures.

69 Zachary Kallenborn, "If the Oceans Become Transparent," *Proceedings* 145, no. 10 (October 2019), https://www.usni.org/magazines/proceedings/2019/october/if-oceans-become-transparent.

70 Sally DeBoer, "Unmanned Underwater Vehicles: A Conversation with Chris Rawley | Center for International Maritime Security," Center for International Maritime Security, June 2, 2015, https://cimsec.org/unmanned-underwater-vehicles-conversation-chris-rawley/.

71 Kelley M. Sayler, "Defense Primer: Quantum Technology" (Washington, D.C.: Congressional Research Service, November 15, 2022), https://crsreports.congress.gov/product/pdf/IF/IF11836.

72 Bryan Clark, "The Emerging Era in Undersea Warfare" (Washington, D.C.: Center for Strategic and Budgetary Assessments, January 22, 2015), https://csbaonline.org/research/publications/undersea-warfare.

73 Sayler, "Defense Primer: Quantum Technology."

74 Edward Parker, "Commercial and Military Applications and Timelines for Quantum Technology" (Santa Monica, CA: RAND Corporation, October 28, 2021), https://www.rand.org/pubs/research_reports/RRA1482-4.html.

Finally, the proliferation of commercial imagery, particularly from satellites, is degrading the secrecy that typically surrounds national submarine programmes. Naval shipyards and submarine bases can be persistently monitored by companies, think tanks[75], and even crowd-sourced investigators like Bellingcat.[76] For example, a Federation of American Scientists analyst was able to observe the installation of China's first submarine demagnetization facility, which strips submarine hulls of residual magnetic fields, pointing to Chinese efforts to deploy less detectable submarines.[77] In the past, such imagery and analysis would have remained highly classified and limited to small groups of government analysts. This has also had an impact on the detectability of surface platforms, with both state-owned and commercial satellites using Synthetic Aperture Radar (SAR) being able to develop and track with high resolution low-observable surface platforms (i.e. 'stealth ships') that are otherwise more difficult to detect.[78]

For every advancement in offensive capability, there will be defensive countermeasures

Taken together, these developments are degrading the secrecy that typically surrounds subsurface operations. ASW detection and the monitoring of the infrastructure that supports submarine forces threaten both conventional submarine missions but also the survivability of sea-based nuclear deterrents. Though technological and doctrinal countermeasures will surely begin to develop, there may remain a gulf as to what can be developed and fielded in time. Importantly, these adaptations will affect almost all navies equally. The relatively low barriers to entry as sensors and data processing becomes cheaper and more efficient mean that both large and small states, as well as non-state players, will have the abilities to monitor subsurface maritime activity much more closely. The implication is that methods and tools for deceiving and evading detection will become more important, even in waters that have been considered safe over the past decades.

Conclusions

The 29 October air- and sea-based drone raid on the Russian fleet at Sevastopol could be the new state of affairs in maritime conflict.[79] The increased transparency of the oceans could render submarine forces visible in every way except for the naked eye. Missiles could well make surface operations prohibitively costly. These developments pose direct challenges to the normal way of operating for the RNLN and its European partners. What is stressed here, however, is understanding how these trends fit within the context of overall adversary strategies and operational concepts. These trends also offer opportunities. Unmanned vehicles, be they remote or semi-autonomous, can reduce the risk to life and injury that manned operations entail. For certain tasks, such as harbour and other infrastructure monitoring, they can also be developed and deployed at a generally lower cost. For every advancement

75 CSIS, "High Resolution," Center for Strategic and International Studies, n.d., https://www.csis.org/high-resolution.

76 Bellingcat Investigation Team, "You Told Us Where To Point A Satellite. Here Are The Results," November 2, 2021, https://www.bellingcat.com/resources/2021/11/02/satellite-imagery-poll-results-september-2021/.

77 NTI, "Submarine Detection and Monitoring: Open-Source Tools and Technologies," Paper (Nuclear Threat Initiative, March 2, 2021), https://www.nti.org/analysis/articles/submarine-detection-and-monitoring-open-source-tools-and-technologies/.

78 HI Sutton, "This Is What a Chinese Stealth Warship Looks Like on Radar," USNI News, September 27, 2021, https://news.usni.org/2021/09/27/this-is-what-a-chinese-stealth-warship-looks-like-on-radar.

79 Mark Bowden, "The Tiny and Nightmarishly Efficient Future of Drone Warfare," *The Atlantic*, November 22, 2022, https://www.theatlantic.com/technology/archive/2022/11/russia-ukraine-war-drones-future-of-warfare/672241/.

in offensive capability, there will be defensive countermeasures.[80] The transparency of the oceans is not a uniquely Western issue. It would have a levelling effect and make Russian and Chinese vessels just as vulnerable as any Western submarine. Important as developments in each of these areas are, it is the combination of missile and unmanned attacks from various directions against targets more easily identified by enhanced ISR which will likely have the greatest impact.

Specifically for Dutch and other European maritime states, what the above trends suggest is a post-Ukraine environment in which European ports are more vulnerable to kinetic attack, NATO subsurface assets will be at greater risk while anti-submarine warfare is likely to become more effective, and surface ships will not be able to confidently plan for close-in coastal support to land forces. Each of these affects the *modus operandi* of Western navies that have existed for well over thirty years. Reviewing the assumptions based upon which strategies and concepts have been developed will be an important area of focus. Without a secure rear area, with decreased operational security, and vulnerable surface ships, they simply cannot be ignored. Addressing these challenges with a top-down, strategy driven approach, the right offsets and trade-offs can be identified that can reduce risks and maintain effectiveness.

These trends inform three recommendations that the RNLN and its European partners could consider when developing new maritime concepts and procurement plans. These are:

1. Invest heavily in defensive measures against AShMs, particularly in electronic warfare countermeasures. Where possible, this should be explored as joint projects within the closest defence partnerships, particularly Germany, the UK, France, and Belgium, to ensure interoperable shipboard systems.
2. Find space and invest in experiments that integrate UUVs, USVs, and UAVs into both LIVEXs and routine naval manoeuvres. Incorporating such experimentation into longer cruises both inside and beyond the Euro-Atlantic area would be a way to combine activities and maximise both the realism of experiments and resource efficiency.
3. Experiment with both electronic and physical deception measures and tools and routinely exercise counter-detection manoeuvres. Where possible, work with industry to understand the level of development of civilian-owned satellite imagery and maritime sensors to ensure shipboard tools can be updated to keep pace with industrial developments.

80 Sidharth Kaushal, "Ukraine's Uncrewed Raid on Sevastopol and the Future of War at Sea," Royal United Services Institute, February 2, 2023, https://rusi.org/explore-our-research/publications/commentary/ukraines-uncrewed-raid-sevastopol-and-future-war-sea.

3. Patrolling the Highway: SLOC protection across the Atlantic and elsewhere

Davis Ellison

Secure sea lines of communication (SLOCs) are and have been central to global commerce and a core mission for the world's navies, serving as what military theorist Alfred Thayer Mahan described as "great highways."[81] In peacetime, they are vital shipping lanes; in conflict, they would become highways for military reinforcements and materiel. The protection of SLOCs was crucial to NATO during the Cold War and it remains so given the new Russian threat, and requires the Royal Netherlands Navy and its European partners to invest time and resources in ensuring sufficient capabilities and plans are developed for defending them. This should consider the context that the U.S. Navy is unlikely to be the primary defender of these SLOCs should it be involved in conflict in the Indo-Pacific. Controlling them, or being able to constrict adversaries' SLOCs, is a foundational element of sea power and underpins national power more broadly.[82]

Being able to constrict adversaries' SLOCs, is a foundational element of sea power and underpins national power more broadly

For the better part of eight decades, global SLOCs have been generally secure under the preponderant power of the U.S. Navy and its allied maritime forces. There is a risk in overdetermining these decades as a success, however, as state-on-state war at sea has largely been a rarity, with the exceptions of the 1971 Indo-Pakistani War and the Falklands War. Though major naval warfare has not broken out, SLOC protection has always been at the fore of naval planners' minds, particularly in and around key chokepoints like the Straits of Malacca and Hormuz, the Bab el Mandeb, and the Suez Canal.

The traditional missions of SLOC and maritime chokepoint protection is becoming a more difficult task. Threats stemming from submarines, missile proliferation, unmanned vehicles, and cyber-attacks complicate the ability of European navies to ensure SLOC protection into the future. This chapter will consider in turn the general military-strategic and operational problems of SLOC protection, the specific challenges posed by the Russian Navy towards the Atlantic area and the dilemmas imposed by the growth of China's power at sea. Throughout, the solutions that can address these challenges, and the role of the RNLN within them, will be explored in detail.

81 A. T. Mahan, *The Influence of Sea Power Upon History, 1660-1783*, Revised ed. edition (New York: Dover Publications, 1987), 26.

82 Barry R. Posen, "Command of the Commons: The Military Foundation of U.S. Hegemony," *International Security* 28, no. 1 (2003): 5–46.

SLOC protection: the importance and general challenge

The military-strategic importance of SLOC protection is worth continued emphasis. In both the First and Second World Wars, SLOCs and their protective operations were central to Allied victory in both Europe and the Pacific.[83] The projection of power across the ocean was and is particularly important to the US due to its geographic isolation from the eastern hemisphere.[84] This has also been the case for the British and other capable European navies that maintained global empires and later sought to ensure continued access to far away maritime spaces.

The set of problems that SLOC protection entails are substantial. First and foremost is the challenge of scale. Of NATO's area of responsibility alone, approximately 80% is in the maritime space, ranging from the High North to the Caribbean Sea, with the largest and most capable ally functionally on only one side of that space.[85] In the Pacific, this increases exponentially. Protection operations, be it of shipping lanes or of critical undersea infrastructure, requires the monitoring of vast amounts of ocean. The anti-submarine warfare (ASW) mission alone demands significant investments into undersea sensors, maritime patrol aircraft, surface vessels, and attack submarines. During the Falklands War, the British task force expended nearly all of its ASW weapons engaging false submarine contacts, and the threat from Argentine submarines created serious concerns for the Royal Navy.[86] SLOC and sea control disruption can be achieved by relatively small forces.

An additional challenge is the complexity of modern sea lines of communication. Global shipping and naval operations are dependent on highly networked systems that are vulnerable to attack before ships are even put to sea. Ports have been increasingly subjected to cyber-attacks that disrupt operations to shipping and the risk of China's ownership of port facilities has been continuously raised by senior military commanders. Disruption at a single chokepoint can cause significant second-order effects to global maritime mobility, as seen in 2021 when a grounded ship jammed the Suez Canal for six days.[87] The smooth functioning of SLOCs, whether in peacetime or conflict, depends on many vulnerable systems operating simultaneously.

The Russian Threat to NATO SLOCs

Precisely ascertaining the contemporary Russian threat to Euro-Atlantic SLOCs is a difficult endeavour. Exact Russian plans are, unsurprisingly, state secrets. However, based on past Soviet and Russian behaviours, as well as monitoring of recent exercises of the Northern Fleet, a sense of the Russian approach towards SLOCs can be developed.

83 Rear Admiral Worrall Reed Carter, *Beans, Bullets, and Black Oil: The Story of Fleet Logistics Afloat in the Pacific during WWII* (Newport, RI: U.S. Naval War College, 1951).

84 Posen, "Command of the Commons: The Military Foundation of U.S. Hegemony."

85 Paul van Hooft, "The US and Extended Deterrence," in *NL ARMS Netherlands Annual Review of Military Studies 2020: Deterrence in the 21st Century—Insights from Theory and Practice*, ed. Frans Osinga and Tim Sweijs, NL ARMS (The Hague: T.M.C. Asser Press, 2021), 87–107, https://doi.org/10.1007/978-94-6265-419-8_6.

86 Harry D. Train, "An Analysis of the Falkland/Malvinas Islands Campaign," *Naval War College Review* 41, no. 1 (1988): 40.

87 Alex Christian, "The Untold Story of the Big Boat That Broke the World," Wired UK, June 22, 2021, https://www.wired.co.uk/article/ever-given-global-supply-chain.

Planning for interdicting SLOCs by both the Soviet and Russian naval and air forces has been inconsistent. During the Cold War, the Soviet priority was consistently to protect its Arctic SSBN bastions over using naval forces to strike out towards NATO lines in the Atlantic.[88] Contemporary analysis of Russian priorities does not rule out the possibility that, with a potentially higher willingness to bear costs, naval and air forces could be used against NATO SLOCs in the event of war.[89] However, the U.S.-based Centre for Naval Analyses has stressed that "the current number of Russian surface combatants and submarine forces do not appear to allow Russia to prioritise attacks on SLOCs in the North Atlantic."[90] Recent Russian exercises, particularly Ocean Shield – 2020, appear to reflect this, with the primary aims of the exercise seemingly being to prevent NATO strikes on the Arctic bastion.[91]

The Soviet priority was consistently to protect its Arctic SSBN bastions over using naval forces to strike out towards NATO lines in the Atlantic

This is not to say there is no threat to NATO SLOCs. It is rather that the protection mission has markedly evolved. As described above, threats to sea lines do not only materialise in the form of conventional threats to commercial and military shipping (see also chapter 2), but extend to the seabed and to the ports on either end (see also chapter 1). Critical infrastructure protection has joined the game alongside the possibility of trans-Atlantic escort missions. Importantly, the ability of NATO maritime forces to operate in the Baltic Sea would be contested by Russian capabilities based in Kaliningrad and the Western Military District, though this will be greatly offset as Finland and Sweden are fully integrated into NATO over the coming months. Additionally, the requirement for Russia to maintain naval dominance in the Black Sea will be a persistent drain on any possible maritime operations against states in the Baltic region. This is to say nothing of the depletion of Russian naval infantry in the war.

The Russian threat to the Euro-Atlantic SLOC comes primarily from the Northern Fleet based in Severomorsk, Polyarny, Olenya Bay, Gadzhiyevo, Vidyayevo, Bolshaya Lopatka, and Gremikha.[92] Given the navigability of the North Sea Route, and its control by Russia, it is quite plausible that in the event of war Russia could flexibly move capabilities from its Pacific Fleet as well. Surface ships can conduct sea control operations, especially when under the cover of land-based air forces, while SSNs and SSGNs could still be used to pressures the Atlantic SLOC, particularly along the GIUK (Greenland-Iceland-UK) line and the Norwegian and North Seas. In the extreme, Strategic Ballistic Missile submarines (SSBNs) could move into the Atlantic either to threaten North America or to pressure Europe from the east, though this would be a risky operation with a prized capability, to say nothing of the risk of nuclear escalation.

88 Christopher A Ford and David A Rosenberg, "The Naval Intelligence Underpinnings of Reagan's Maritime Strategy," *Journal of Strategic Studies* 28, no. 2 (April 2005): 379–409, https://doi.org/10.1080/01402390500088627; George Lindsey, "Conventional Maritime Operations and NATO Sea Lines of Communication," *IISS Adelphi Papers*, Adelphi Papers, 29, no. 241 (1989): 39–47.

89 Steve Wills, "'These Aren't the SLOC's You're Looking for': Mirror-Imaging Battles of the Atlantic Won't Solve Current Atlantic Security Needs," *Defense & Security Analysis*, January 27, 2020, https://www.tandfonline.com/doi/full/10.1080/14751798.2020.1712029.

90 Katarzyna Zysk, "Russia's Military Build Up in the Arctic: To What End?" (Arlington, VA: Center for Naval Analyses, September 2020), https://www.cna.org/reports/2020/09/IOP-2020-U-027998-Final.pdf.

91 "Учения ВМФ России 'Океанский Щит - 2020' Начались На Балтике - ТАСС," TASS, August 3, 2020, https://tass.ru/armiya-i-opk/9109979; "Боевые Корабли ВМФ России в Рамках Учений «Океанский Щит-2020» Выполнили Боевые Упражнения На Балтике : Министерство Обороны Российской Федерации," Ministry of Defence of the Russian Federation, August 6, 2020, https://function.mil.ru/news_page/country/more.htm?id=12305748@egNews.

92 Tamara Patton, Pavel Podvig, and Phillip Schell, "A New START Model for Transparency in Nuclear Disarmament: Individual Country Reports" (New York & Geneva: United Nations Institute for Disarmament Research, 2013), https://unidir.org/sites/default/files/publication/pdfs//a-new-start-model-for-transparency-in-nuclear-disarmament-individual-country-reports-en-415.pdf.

Deterrence in Europe depends on unencumbered passage across the Atlantic. Put by strategy theorist Colin Gray in 1986, "...if NATO is unable to maintain a working control of the North Atlantic SLOC, then virtually any measure of NATO success on the ground in blunting an invasion will be negated by the alliance's inability to provide logistic support to keep the struggle going."[93] If Russia perceives a weakening in NATO's ability to defend the trans-Atlantic link, this further risks stability on the European continent.

Several solutions to the threat of Russian SLOC interdiction are readily apparent. Improved ASW by enhanced seabed-to-space sensing can decrease the ability of submarines to operate unseen as they try to pass through the GIUK gap or even as they leave the northern bastion. This includes technical solutions such as the U.S. navy's Deep Reliable Acoustic Path Exploitation System (DRAPES)[94], an improved submarine detection array, and NATO's 'digital ocean' programme which has the longer-term ambition of creating an Internet-of-Things for the ocean that can connect a larger number of sensors to greater data processing capacities.[95] Beyond this, and assuming U.S. involvement in operations, NATO maintains a preponderance of maritime power in the Atlantic with the capability to deploy SSNs and carrier strike groups to degrade Russian capabilities. A potential naval fight in the Baltic Sea would certainly present a more constrained geographic area for naval forces, but this is largely offset by the numerical superiority of NATO airpower in the region as well as over-lapping missile systems between the alliance and Russia.

For the RNLN in particular, there are two clearly identifiable roles. First is to contain Russian surface and subsurface forces within the GIUK gap and engage them within the Norwegian and Arctic seas. The second is for the Dutch Marines to support NATO forces in the Arctic and Baltic as they target Russian forces. This second role is explored in more detail in the chapter on the use of amphibious forces. Returning to the first then, this implies a revisitation of operating concepts and platform investments to ensure a mix of surface and submarine capabilities that can function both independently and as part of a multinational/NATO force engaged north of the GIUK line.

Grasping the Indo-Pacific Challenge for European Navies

As regards China, SLOC interdiction as a concept has appeared within military-strategic thought for decades. In subsequent volumes of *The Science of Campaigns*, a publication of the Chinese National Defence University, "Sea-Line Interdiction Campaign[s]" receive the attention of an entire chapter. The focus in this work is less on intercepting ships on the high seas (presumably in the Western Pacific), but more on raiding lines much closer to their debarkation points and even striking ports themselves. What is particularly noted is that such an interdiction campaign would be "long in duration" and occur over an "expansive battle space".[96]

93 Colin S. Gray, "Maritime Strategy," *Proceedings* 112, no. 2 (February 1986).

94 "U.S. Navy Invests in Subsea Threat Detection Array," The Maritime Executive, November 1, 2016, https://maritime-executive.com/article/navy-invests-in-subsea-threat-detection-array.

95 Keit Pentus-Rosimannus and Michael D. Brasseur, "The 'Digital Ocean' as a Model for Innovation in the Perfect Storm," *Atlantic Council* (blog), August 19, 2020, https://www.atlanticcouncil.org/blogs/new-atlanticist/the-digital-ocean-as-a-model-for-innovation-in-the-perfect-storm/.

96 Yuliang Zhang, *Science of Campaigns*, In Their Own Words (Beijing: National Defense University Press, 2006), 599–605. This has been continuously reinforced in PLA writings, including the 2020 edition of *The Science of Military Strategy*.

The Western Pacific SLOC challenge is fundamentally different than in the Euro-Atlantic. In the case of a Russia/NATO conflict, the challenges and respective trade-offs are based on the Atlantic SLOCs and the Russian Arctic SSBN bastion being geographically separate. In the Pacific, particularly the South China Sea, the SLOC and the bastion are co-located, particularly with the existence of Longpo Naval Base on the southern coast of Hainan Island.[97] SLOC protection then, either implicitly or explicitly, risks the misperception that forces are being routinely deployed that can directly challenge China's SSBNs.

The overall threat of SLOC interdiction is unlikely to extend over the breadth of the Pacific. Any efforts would likely be limited to key chokepoints and approaches to possible operational areas in the South and East China Seas, including the Malacca, Taiwan, and Korea straits. Beyond these immediate risk areas, experts have also considered that in the event of war with the U.S. over interests in the Western Pacific, the Chinese navy could well establish submarine screens in a location such as the Philippine Sea in order to interdict U.S. and allied attempts to maintain SLOCs to besieged states. The potential use of anti-ship missiles (AShMs) in a SLOC interdiction role has also been raised.[98]

The Western Pacific SLOC challenge is fundamentally different than in the Euro-Atlantic

It is useful to consider the challenge not only from the U.S. perspective, but also those of states in the region, particularly those whose maritime claims conflict with China's 'nine dash line'. Resupply and freedom of navigation for Indonesia and the Philippines does not involve the trans-Pacific journey that U.S. navy planners face, but rather a much more persistently contested 'grey-zone' environment in which their opponent possesses escalation dominance nearby and frequently inside their own territory. Japan, for example, has been increasingly pressured by Chinese submarine manoeuvres near Okinawa and the Senkaku Islands.[99] In the event of conflict with China, these states' SLOCs connecting to neighbouring states and the world outside of the Western Pacific would become their highly-contested lifelines.

What is the particular challenge for European navies when it comes to the Indo-Pacific? The answer is relatively clear for the US and its regional allies. For Europe, the last several years have seen a greater interest in Indo-Pacific security affairs through NATO, the EU, and individual states. Several states, namely France, the UK, Germany, and the Netherlands make regular multilateral and individual naval deployments to the region as part of freedom of navigation exercises and as part of enforcing UN sanctions against North Korea. SLOC protection in the Western Pacific for European navies, however, makes little sense. The US, regional states, and even China itself, have their own interests in maintaining maritime trade routes and SLOCs in the Western Pacific, while European states will be called upon to supply their assets in the Euro-Atlantic theatre. It is simply not clear what precisely European navies would be there to protect. A role for Europe in Indo-Pacific SLOC protection is arguably clearer further west in the Western part of the Indian Ocean, in the Persian Gulf, Bab el Mandeb, and Red Sea, where European navies already operate frequently and there is a clearer strategic logic as those areas serve as vital maritime approaches to the Euro-Atlantic.[100]

97 Tong Zhao, "Tides of Change: China's Nuclear Ballistics Missile Submarines and Strategic Stability" (Washington, D.C.: Carnegie Endowment for International Peace, 2018), https://carnegieendowment.org/files/Zhao_SSBN_final.pdf; Chris Rahman and Martin Tsamenyi, "A Strategic Perspective on Security and Naval Issues in the South China Sea," *Ocean Development & International Law* 41, no. 4 (November 17, 2010): 315–33, https://doi.org/10.1080/00908320.2010.499277.

98 Mark F. Cancian, Matthew Cancian, and Eric Heginbotham, "The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan," CSIS International Security Program (Center for Strategic and International Studies: Washington, D.C., January 2023), 112, https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/230109_Cancian_FirstBattle_NextWar.pdf?VersionId=WdEUwJYWlySMPlr3ivhFolxC_gZQuSOQ; Roger Cliff, *China's Military Power: Assessing Current and Future Capabilities* (Cambridge, UK: Cambridge University Press, 2015), 234.

99 Sheila A. Smith, *Japan Rearmed: The Politics of Military Power* (Cambridge, MA: Harvard University Press, 2019), 113–14.

100 van Hooft, Girardi, and Sweijs, "Guarding the Maritime Commons: What Role for Europe in the Indo Pacific"; van Hooft and Sweijs, "Why Should Europe Guard the Indo-Pacific Maritime Commons: Order, Access, or US Hegemony?"

For the RNLN, the challenge is less one of capabilities but rather balance. The Dutch commitment to routine Pacific patrols does necessitate proper attention. With 4 *De Zeven Provinciën* and 2 *Karel Doorman*-class frigates, and continued modernisation investments, the RNLN has the right surface ships for a SLOC protection role in the western Indo-Pacific. This limited number, however, raises important questions about where and when to use these frigates. With heightened maritime activity in the Euro-Atlantic and an increased interest in an Indo-Pacific role there is risk of becoming overstretched. Additionally, with a high operational tempo between theatres there would be an attendant increase in maintenance and refit costs. Regular operations such as that conducted in 2021 by HNLMS *Evertsen* as part of the UK Carrier Strike Group which took the vessel from the Euro-Atlantic, the Mediterranean, the Black Sea, the Indian Ocean, and the Philippine to the South China Sea can be expected in the future.[101] A more pragmatic role in the Western Indian Ocean, rather than further east, should be considered if the policy aim is to contribute to SLOC protection.

Conclusions

Competing pressures on naval forces implies a flexible procurement and modernisation strategy

The importance of SLOC protection has not changed, though the way in which threats present themselves has evolved. European navies, including the Dutch, can be expected to plan for and resource an array of activities in and around SLOCs, ranging from freedom of navigation and naval diplomacy in the Pacific to supporting full-scale reinforcement efforts from North America. The latter case in particular is an important demonstrative element in NATO deterrence strategy. Competing pressures on naval forces implies a flexible procurement and modernisation strategy that can provide for both general purpose use in areas of less immediate interest (i.e. Western Indian Ocean) and more specialised capabilities to counter threats in the most challenging areas. In investments, this means a rough balance of:

1. European-owned ASW assets, particularly maritime patrol aircraft (MPA) and UUVs/USVs, that can contribute to the network of NATO sensors across the Euro-Atlantic Area, particularly in GIUK gap and the North Sea.
2. European-owned ISR assets, particularly modelled on the U.S. Sound Surveillance System (SOSUS) passive sonar network in the Atlantic.
3. Marine forces that can contribute to multinational amphibious task groups across NATO and the EU's areas of responsibility, while maintaining a robustness to deploy independently to areas of Dutch responsibility (e.g., the Caribbean).
4. General-purpose frigates to conduct patrols in the Western Indian Ocean or Persian Gulf area and to ensure SLOCs between the Indo-Pacific region and Europe can remain open.

For the RNLN, this means a balance between maintaining and modernising existing surface vessels, namely its frigates, and assuring sufficient quantity and capability for *Walrus*-class submarines and their planned replacements. Importantly, an emphasis on interoperability and frequent engagement with allied and partner maritime forces will allow for a more seamless role for the navy in broader multinational efforts. SLOC protection is of national interest for the Dutch government and its allies, and ensuring a role for the Dutch in this is a priority that cannot be overstated.

101 "UK, Netherlands, United States and Japan Complete Intensive Joint Exercises in the Pacific," Royal Navy, August 25, 2021, https://www.royalnavy.mod.uk/news-and-latest-activity/news/2021/august/25/210825-pacific-exercises-for-carrier-strike-group.

4. Amphibious Operation: Continued value in an age of denial

Frederik Mertens

Amphibious forces have two realistic roles in contemporary operations: raiding in contested areas and support to contingency operations like humanitarian response. Amphibious operations have always been difficult and require dedicated capabilities and both sea control and air superiority. This difficulty has further grown with the vertical and horizontal proliferation of mobile land-based, longer-range, more precise missiles and unmanned vessels that could be used to target amphibious forces attempting to make a landing. This has led some, including the current commandant of the U.S. Marine Corps, to give up on the style of amphibious assault of the Second World War that feeds the image of how these operations are conducted.[102]

Amphibious operations have always been difficult and require dedicated capabilities and both sea control and air superiority

Importantly, threats and potential amphibious roles vary across different regions, building on the logic of chapter 1 and the implications of chapter 2. In the Euro-Atlantic, marine forces could be employed to raid Russian targets in the Baltic and/or Arctic. On the hinge to the Indo-Pacific, in the Red Sea and the Gulf, they could either serve a training role for regional partners or be stationed alongside allied forces in a deterrence posture against China In the Mediterranean they could be used for rapid response to a sudden crisis. In the Caribbean, they could serve in humanitarian response.

While this versatility makes marine forces an ideal choice for leaders and planners that desire flexibility, current security challenges and limited means necessitate a focus on clear tasks to guide capability development and training regimens. For European forces, including the Royal Netherlands Navy, clear priorities lie in raiding, counterterrorism, anti-piracy operations and humanitarian response in the NATO area and of national territory outside of Europe in a supportive role .

The following sections will describe the traditional use of amphibious forces and how they have been developed for use in both Europe and abroad. It will then lay out how the decrease in survivability due to technological developments, as discussed in chapter 2, challenges current approaches, particularly the reliance on large and vulnerable amphibious ships and slow, short-legged assault craft. It will conclude by identifying those amphibious missions which most realistically remain, and how European and Dutch marine forces can develop and posture themselves to these tasks.

102 Jack Watling and Sidharth Kaushal, “Amphibious Assault Is Over,” October 30, 2023, https://rusi.orghttps://rusi.org.

Amphibious operations: the challenge of denial technologies

Amphibious operations are one of the primary ways in which sea power can influence the land battle. This can vary from small temporary raids, through limited tactical landings and the taking of relatively small island targets, to major strategic operations intended to open a new front. The 1982 British raid during the Falklands War on the Argentine defenders of the Pebble Island airstrip to destroy enemy aircraft and airfield facilities is a good example of what a raid can achieve; the sustained effort of Operation Overlord to get the Anglo-American armies ashore in Western Europe in 1944 is the most obvious example of a successful and game changing, large-scale amphibious attack. These two extreme examples illustrate the different magnitudes of scale that can exist between amphibious operations and the preparations needed for what were and remain some of the most exacting operations of war. Great Britain was able to conduct the raid on Pebble Island almost on the fly with only the capabilities it had available at the start of the Falklands War.[103] To mount Operation Overlord, the full mobilisation of the Anglo-American economies and societies, years of dedicated buildup of the necessary forces and shaping the theatre were necessary. Today, an amphibious force should have the skills, equipment and flexibility needed to attempt the former, but the equivalent of a landing on Normandy seems unthinkable with present-day technologies.

With the anti-ship missile (AShM; see chapter 2), the age of maritime denial further evolved. Even small regional powers, and non-state actors, have access to impressive sea denial capabilities. This is part of a multi-decade trend which makes amphibious operations more challenging. Combining high speed, long range and deadly impact with ease of carriage, AShMs introduced a new element into the mix of aircraft and submarines that had dominated the war at sea since the Second World War.[104] Fired by aircraft, surface ships and submarines, they have become the main ship killing weapons of modern naval warfare.[105] This threat has further grown with the proliferation of longer ranged land-based AShMs with enough range to threaten vast swathes of sea space hundreds of miles from the nearest shore.[106] Their most recent and visible feat of arms is the destruction of the Moskva in 2022 by Ukrainian R-360 Neptune missiles, driving the Russian fleet away from Ukraine's Black Sea shores and effectively neutralising Russia's amphibious capability. They are particularly threatening to amphibious operations. China has massively invested in this capability to create A2/AD bubbles aimed at preventing the U.S. Navy from operating close to the Chinese shore. Taiwan has created its own A2/AD bubble to deter China from a possible invasion. Being mobile and relatively small, these missile batteries are easily hidden, which makes destroying them with airpower or ship-launched missiles like the Tomahawk very difficult.[107]

The increased AShM threat is added to the already existing challenges that an amphibious assault must weather in an ever more transparent battlefield. The importance of protective

103 Francis Mackay and Jon Cooksey, *Pebble Island: The Falklands War 1982* (Casemate Publishers, 2017).

104 Robert D. Colvin, "Aftermath of the Elath," U.S. Naval Institute, October 1, 1969, https://www.usni.org/magazines/proceedings/1969/october/aftermath-elath.

105 John Shields, "Air Power in the Falklands Conflict : An Operational Level Insight into Air Warfare in the South Atlantic," 2021, 1–376. During the Falklands War in 1982 a mere *five* MM.39 Exocet missiles and the *four* Super-Étandards formed an Argentinian pocket of excellence that dictated the entire British strategy, while the smart Argentinian improvisation of placing a few MM.38 Exocet missiles hit HMS Glamorgan and inaugurated the era of land-based AShM

106 Terrence K. Kelly et al., "Employing Land-Based Anti-Ship Missiles in the Western Pacific" (RAND Corporation, November 1, 2013), https://www.rand.org/pubs/technical_reports/TR1321.html.

107 The failure of American air power to knock out the mobile Iraqi Scuds in 1991 and off Russian air power to defeat the mobile Ukrainian air defences are clear testaments of the challenges involved.

air superiority and being able to achieve and exploit a beachhead remain the key elements of amphibious assaults in contested areas. Even in more benign, uncontested landings there are significant logistical and planning challenges to be overcome.[108] Some commentators and certain marine forces, including the U.S. Marine Corps, even seem to have written off the task of amphibious landings.[109]

However, raiding, and contingency operations, like counterpiracy and humanitarian assistance, remain just as salient, even in the context of great power competition. For the Royal Netherlands Marine Corps in particular, its responsibilities in the natural disaster-prone Caribbean, potential duties in the Red Sea and Persian Gulf and the deep cooperation with other NATO marine forces preclude a premature downgrading.

One solution to the increased threat to amphibious ships is embracing stand-off landing operations, in which the mother ships deploy at a (relatively) long distance from the landing points. The distance to the landing points will have to be crossed by landing craft that are sufficiently fast to cover this distance swiftly and have the range to do so. In practice, this means either relying on Vertical Take-Off and Landing (VTOL) capable aircraft – helicopters and tilt-rotor aircraft – and ship-to-shore connectors like hovercraft or swift raiding style landing boats.[110] However, helicopters and tilt rotor aircraft have limited lift capability that makes deploying heavy weapons and vehicles far more difficult or impossible. Hovercraft combine relatively long range and speed with impressive lifting power and the capability to land on beaches other ships cannot, but are large, noisy and complex craft. Both helicopters and hovercraft are expensive and require large mother ships. Raiding style landing boats offer decent speed and good range, but lack the capability to land (heavy) vehicles and cannot strike inland. [111] Realistically, the large motherships *and* the connectors needed to conduct sizeable (battalion scale and beyond) stand-off amphibious operations would stretch the financial reach of the Netherlands and would drain scarce manpower from other ships. The RNLN would likely have to rely on the capabilities of allies.

Amphibious operations are one of the primary ways in which sea power can influence the land battle

A more realistic alternative is to downscale the Dutch ambitions from large scale amphibious operations and focus on raiding from the sea, using the Dutch Marines both as a striking force on its own and as part of a wider reconnaissance-strike complex in which they provide the targeting information for stand-off weapon systems like Pulse, TACTOM or the F-35. The stand-off requirement would remain the same, but the smaller size of the landing forces involved makes such operations more feasible for a nation with limited resources allocated to its amphibious forces.

108 The difficulties faced by the United Nations forces in 1991 while landing in Mogadishu offer a good indication of how complex amphibious operations are even without a serious threat.

109 Michael O'Hanlon, "The Questionable Future of Amphibious Assault," Brookings, accessed November 6, 2023, https://www.brookings.edu/articles/the-questionable-future-of-amphibious-assault/.

110 Sydney J. Freedberg Jr, "Marines Need Speed From Ship To Shore," *Breaking Defense* (blog), October 26, 2017, https://breakingdefense.sites.breakingmedia.com/2017/10/marines-need-speed-from-ship-to-shore/.

111 BMT Nigel Gee Ltd, UK et al., "Thinking Inside the Box – Development of a Monohull Fast Landing Craft," in *Warship 2010: Advanced Technologies in Naval Design and Construction* (Warship 2010: Advanced Technologies in Naval Design and Construction, RINA, 2010), 91–100, https://doi.org/10.3940/rina.ws.2010.10.

Amphibious operations: the Russian threat in the Baltics, Finland, Norway, and the High North

While large- scale amphibious operations will become more difficult in the future, the need to deploy reinforcements by sea remains, both between the US and Europe and within the European theatre (as discussed in chapter 3). This applies specifically to the heavy material and supplies that would be needed for all-arms combat against a peer opponent. The challenges differ for the Baltic States, Finland, and Norway and the High North.

Within Europe, this poses a specific problem for the Baltic States and Finland. Considering the vulnerability of the Suwalki Gap between Poland and Lithuania to Russian attack and the long route through Finland's northern Lapland region, these will have to be reinforced by sea. It is, however, unlikely that this will demand amphibious as opposed to sealift capabilities, although the relative vulnerability of the Baltic Ports might place a premium on flexible ship to shore connectors.[112] In the High North, the inclusion of Finland and Sweden has made reinforcing Norway less uniquely dependent on amphibious or sealift capabilities, as overland routes have now become available to route troops and supplies to Finnmark on Norway's northernmost coast. This limits the ability of the Russian Fleet to interfere with NATO reinforcements.[113]

The vulnerability of the Baltic States is one of NATO's main concerns. NATO has only deployed limited forward forces, relying on a deterrence by punishment approach and a surge of reinforcements. This strategy is compromised by the Russian A2/AD bastion of Kaliningrad.[114] The Baltic Sea is relatively small, narrow and shallow. Entry of larger ships (the Russian river and canal network allows ships of smaller tonnage transit through their inland waterways) is only possible through the Danish Straits. The Baltic Sea is an air theatre first and a naval theatre second. The vulnerability of surface forces is further exacerbated by the ever-growing reach of land-based AShMs to all choke points and over an ever-growing part of the sea while *all* ships in the Baltic are very vulnerable to sea mines. With the inclusion of Sweden and Finland into NATO, only the Kaliningrad exclave between Poland and Lithuania and the Russian shore around St. Peterburg are potentially hostile. The rest of the shorelines will be NATO territory from the start of any conflict – this is especially important as it will allow the use of Swedish territorial waters at the start of any conflict, limiting the threat from Kaliningrad.

Whether Kaliningrad is a danger is in fact not so much a military as a political question. The war in Ukraine has illustrated the power of indirect fire and deep strike weapons and their ability to dominate terrain deep behind the frontlines.[115] If NATO is willing to attack Kaliningrad – even if only with indirect fires and airpower – the Russian A2/AD bubble would quickly

112 Mark F. Cancian, Sean Monaghan, and Daniel Fata, "Strengthening Baltic Security: Next Steps for NATO," June 27, 2023, https://www.csis.org/analysis/strengthening-baltic-security-next-steps-nato.

113 ESD Editorial Team, "Is the War in Ukraine Affecting Norway's Security Situation? – During the Cold War, Norway's Northernmost County, Finnmark, Was, along with Turkey, One of the Only Land Areas in NATO That Had a Direct Land Border with the Soviet Union. - European Security & Defence," October 14, 2022, https://euro-sd.com/2022/10/articles/27552/is-the-war-in-ukraine-affecting-norways-security-situation-during-the-cold-war-norways-northernmost-county-finnmark-was-along-with-turkey-one-of-the-only-land-areas-in-nato-that-h/.

114 William Di Rubbio, "Countering Kaliningrad's Threat to NATO," November 3, 2023, https://rusi.orghttps://rusi.org.

115 Patrick Hinton, "Lean on the Barrage: The Role of Artillery in Ukraine's Counteroffensive," December 5, 2023, https://rusi.orghttps://rusi.org.

collapse.[116] The same applies to the Russian Baltic Fleet, which is unlikely to survive long against the combined land-based, surface, subsurface and air threat. If it comes to a battle in the Baltics, the main danger would more likely come from the Russian air forces that can strike all over the Baltic, although the inclusion of Finland and Sweden in NATO will allow for an integrated air defence of the entire Northern flank.[117]

In this context, it becomes more likely than not that NATO will leverage maritime mobility in the Baltic before and during any future war with Russia. If there is a period of increasing tensions and the decision to reinforce the Baltic States is taken, it is unavoidable that sea transport will take a central role. If hostilities erupt, the importance of sea transport will only grow. In both cases, air defence escorts will have to be provided. The USN regularly forward deploys AEGIS destroyers and cruisers in the Baltic and the Netherlands should seriously consider the possibility that their present and planned highly capable air defence ships will be considered to be likely candidates to support such operations. If these were to escalate and war would erupt, the most dangerous phase would be the first hours where the Russian A2/AD capabilities might still be mostly intact and the Baltic Fleet might still have ships at sea – a short and vicious fight would that would most likely result in the destruction of the Russian forces but during which NATO units might still suffer severe casualties.

The main challenge in operating in the High North is finding the right balance between defending NATO territory and threatening the Russian position in the Kola Peninsula

Special Forces operations by amphibious troops against the Kaliningrad enclave are prohibitively dangerous. They would also be militarily unnecessary considering NATO ground and airpower within the region. However, amphibious capability might very well be needed to reinforce the Baltic states that have few ports. The unique ability of amphibious ships to deliver troops and supplies without the need for additional infrastructure could be of crucial importance. A far more likely theatre of operations for amphibious forces would be the Finnish Gulf which would become a bitterly contested area in the case of a war between Russia and NATO. Studded with small islands and within easy reach of indirect firepower and airpower, versatile maritime raiders would be a very welcome addition to allied strength.

Although the distances in the Norwegian Sea and the Arctic are hardly comparable with the Pacific, the area of operations is incomparably vaster than the Baltic Sea and if possible, even more hostile. Sea ice and winter storms make this one of the harshest environments in which to operate. Strategically, it is a zone of passage from which Russia can extend its power either into the Atlantic or Western Europe and NATO can threaten Russian interests in the High North. In the South-West it is bordered by Greenland, Iceland and the UK and in the South-East by Norway and the North Sea. In the North, surface ships and conventional submarines are limited by the Polar sea ice, but nuclear submarines can even operate beyond.

It is highly unlikely that Russia will be capable of seriously threatening the GIUK-N line with amphibious or airborne forces. The main strategic vulnerability of Norway is its thinly inhabited Northern Finnmark province. Even further north, Svalbard, Franz Josef Land and Novaya Zemlya offer tenuous bases from which to control the surrounding ocean. Although exposed to the most extreme weather imaginable and isolated from both NATO and Russian territory, their potential should not be overlooked. The main challenge in operating in the High North is finding the right balance between defending NATO territory and threatening the Russian position in the Kola Peninsula and the Arctic Ocean.[118] The inclusion of Sweden and Finland in NATO has made the defence of Finnmark far more realistic and less dependent on

116 Robert Dalsjö, Michael Jonsson, and Christofer Berglund, "Bursting the Bubble? Russian A2/AD in the Baltic Sea Region: Capabilities, Countermeasures, and Implications," n.d.

117 Johan Engvall et al., "Western Military Capability in Northern Europe 2020: Part II National Capabilities," n.d.

118 Jyri Lavikainen, "Russia's Redefined View on Strategic Stability: A Security Dilemma in Northern Europe?," n.d.

amphibious support: while Russia can no longer concentrate its full might on Norway, land communications and integrated Scandinavian air defences make it far easier to reinforce NATO's northern flank.

There is still potential for amphibious operations in support of naval action in the Norwegian and Arctic Seas.[119] The seaward flank of Finnmark might still be contested by amphibious and airborne forces against which NATO troops should be deployed. More important might be the outlying islands in the Norwegian and Arctic Seas. Svalbard is vulnerable to Russian offensive/defensive moves and Nagurskoye Airbase on Franz Josef Land is a crucial outer lynchpin of Russia's Arctic Bastion. The use of amphibious forces to breach and secure the outer defences of Russia's northern strongpoints is an option. Although the total numbers of troops involved would be limited, their strategic impact would be major. The main caveat is that any operations here should be carefully considered in terms of the strategic message to Moscow.

In short, in the Baltic Sea but especially in the Arctic and Norwegian Seas there is a definite need for amphibious forces. A focus on raiding sized operations of up to a battalion level strength seems to be logical. Larger brigade and division sized amphibious operations are both highly vulnerable and other capabilities make them largely redundant. The Baltic operations are mostly coastal and can count on ample ports being available for the smaller craft required and/or will be heavily using helicopters. Considering the threat from sea-mines, airpower and land-based missiles, it is likely that larger amphibious ships will leverage the presence of these ports to extend the range of their smaller craft. The vast distances of the Norwegian and Arctic Seas make larger amphibious ships mandatory. Finally, the value of the Royal Netherlands Marine Corps primarily offers NATO forces an important tactical, operational and strategic multi-domain capability that is not wedded to the amphibious domain. As highly trained arctic capable raiding infantry – operating on their own or as part of a reconnaissance-strike complex in multi-domain operations providing targeting information for air forces or naval deep strike (TACTOM) –, Marine units can be deployed by intra-theatre air transport from the North of Finnmark to the deep woods of Finland to the islets of the Finnish Gulf. One of the main advantages of an amphibious capability is its inherent versatility. Their ability to intervene far from Dutch territory from wherever the sea offers access makes them a key element of the Dutch armed forces.

Anti-piracy, counterterrorism, and humanitarian relief in North Africa, the Red Sea, and the Gulf

The focus on the Russian danger should not close our eyes to dangers of endemic instability on NATO's Southern flanks. Renewed Great Power competition has the potential to further fuel the many (intrastate) wars raging in Africa and the Middle-East while most military resources are now reoriented to deal with the direct Russian threat from the East.[120] A prime strategic advantage of amphibious forces is that they can be used both to defend NATO from Russia and to protect NATO, EU and Dutch interests in the South. By virtue of their strategic mobility and inherent flexibility, amphibious forces can be deployed relatively swiftly. Along the

119 Heather A. Conley, Matthew Melino, and Jon B. Alterman, "THE ICE CURTAIN: RUSSIA'S ARCTIC MILITARY PRESENCE," March 26, 2020, https://www.csis.org/analysis/ice-curtain-russias-arctic-military-presence.

120 Luis Simón and Pierre Morcos, "NATO and the South after Ukraine," May 9, 2022, https://www.csis.org/analysis/nato-and-south-after-ukraine.

Mediterranean, the Red Sea, the Persian Gulf and the shores of Africa, 'sea soldiers' offer a commander a vital and versatile tool, making them a key asset in the Dutch arsenal.

NATO and European power is more limited outside of NATO's area of operations. Many nations in these regions invest in strong air forces, non-negligible navies and land-based AShMs. Even non-state actors like the Houthi rebels possess advanced weaponry– in their case provided by Iranian support.[121] Ships operating in these seas will need a level of protection comparable to what is needed against Russia, or risk becoming terribly vulnerable if a situation escalates. Amphibious ships have their vulnerability further increased by their complement of amphibious troops, making them a very tempting target for an opponent looking to produce the greatest number of casualties and achieve maximal political impact with an attack.[122]

The goal of all sea power is to influence what takes place on land

Amphibious troops must expect to perform missions along the full spectrum of violence in these areas. This can range from amphibious or airborne raids and rescue missions against (near) peer opposition through counterinsurgency and counter-piracy support to training, showing the flag and humanitarian intervention. In all these scenarios, highly trained light infantry and flexible amphibious ships will provide the Netherlands, the EU and NATO with a allround set of skills and abilities to perform missions on sea and in the littorals.

These versatile capabilities will also remain in great demand in the Caribbean. While the Royal Netherlands Marine Corps remains responsible for the defence of the Dutch territories, the threat of Venezuelan adventurism should not be overestimated. The policies of the Biden administration have significantly decreased local tensions and while these might again flare up under a future Republican administration, the threat of American intervention should deter any Venezuelan aggression. A far greater and likely danger is contamination by drugs-cartel fuelled violence. And it is certain that extreme weather events fuelled by climate change will happen more often and will have more impact in the next decades besides other natural disasters. In these cases, amphibious forces can play a crucial role in swiftly delivering vital humanitarian aid before regular support becomes available.

Conclusions

Ultimately, the goal of all sea power is to influence what takes place on land. One of the main ways in which a navy can achieve this is with sea soldiers. Although the difficulties of doing so are great in this age of denial, amphibious forces remain a flexible, versatile and indispensable instrument of a balanced naval force.

Considering the difficulties in mounting large scale amphibious operations, the most logical Dutch approach would be to focus on raiding forces which are both useful on their own or as part of a multi-national amphibious force. The operations of the Ukrainian marines in the Black Sea show how much impact small groups of raiders can have if properly used. These would offer a theatre commander a very useful capability in the Baltic and Norwegian Seas and show

121 Sam LaGrone, "USS Mason Fired 3 Missiles to Defend From Yemen Cruise Missiles Attack," *USNI News* (blog), October 11, 2016, https://news.usni.org/2016/10/11/uss-mason-fired-3-missiles-to-defend-from-yemen-cruise-missiles-attack.

122 R. Bolia, "The Falklands War: The Bluff Cove Disaster," *Military Review*, November 1, 2004, https://www.semanticscholar.org/paper/The-Falklands-War%3A-The-Bluff-Cove-Disaster-Bolia/068f45e292f152854dbb49d24e505ab7441e5afb.

Dutch commitment to NATO's collective defence. To perform optimally on NATO's Northern Flanks, the Dutch amphibious forces should have:

- In terms of organisation: a tactical organisation of the embarked ground forces that is optimised for raiding and as reconnaissance elements of multi-domain operations, and tailored to allow complete tactical units to be delivered from the ship to the battle area with one lift of the ship to shore connectors.
- In terms of capabilities: fast ship to shore connectors with a long-range allowing for a measure of stand-off capability and independent deployment in forward harbours. Amphibious ships with the speed and the range to operate as part of fast battlegroups in the Arctic Ocean, which also have basic point defences against the air and missile threat and against small (unmanned) surface craft. These should include both electronic warfare and hard-kill capabilities.

Besides warfighting missions in the North, capable amphibious raiding forces could play an important role further afield, both in war and in peace. In the dangerous Mediterranean and seas around the Arabian Peninsula, and in more benign waters around Africa or in the Americas, the ability to deploy first class light infantry remains a great asset. Their inherent versatility gives them great utility in operations other than war. In these seas, the Dutch amphibious forces will need:

- In terms of organisation: an embarked ground element that can perform a wide range of different missions along the whole spectrum of violence.
- In terms of capabilities: ship to shore connectors that can deliver a reasonable amount of bulk goods and (light) vehicles. Amphibious ships with the range and endurance to operate for long times in tropical waters with sufficient internal space to embark a wide variety of goods and equipment, which also possess basic point defences against the air and missile threat and against small (unmanned) surface craft. These should include both electronic warfare and hard-kill capabilities.

But in all these cases, the core of the Dutch amphibious force will remain the sea-soldier that it intends to get ashore. The quality, training, and dedication of these men and women is what will make the difference in battle.

Conclusions **Where do we go from here**

There is a clear need to balance between the various ambitious political objectives, missions, naval tasks, capabilities, and regional commitments that have been made

What does the sum of this study mean for the Royal Netherlands Navy? Across each of the respective topics covered in the four essays, there is a clear need to balance between the various ambitious political objectives, missions, naval tasks, capabilities, and regional commitments that have been made. While not primarily a maritime conflict, Russia's invasion of Ukraine has sharpened the tensions between ends, ways, and means in maritime strategy for the Netherlands. Recent political and military ambitions of the RNLN to play an important role not only in NATO but to a much greater extent than in the past decades also in the Indo-Pacific opens some uncomfortable questions about what choices must be made and which efforts should be prioritised. The world's seas and oceans connect regions, but these SLOCs can be disrupted both close to home and further away. While the Russian threat is imminent, the Chinese challenge to regional order in the Western Pacific is considerable, with respectively direct consequences for European security, and less direct consequences for European prosperity. Protection of these waters is needed; yet neither an European nor an American ship can be in two seas at once. Time-space limits are the more pressing in an era of a growing missile threat to surface vessels, and uncertain threats and opportunities from unmanned vehicles of various kinds; moreover, these challenges also change the scope of the use of the Marine Corps, including for amphibious operations. This report has sought to explore these questions and offers a series of four conclusions that may help to answer them.

First, the RNLN should prioritise its efforts across regions as follows:

1. The Euro-Atlantic Area
2. Approaches to the Euro-Atlantic Area (Red Sea, Mediterranean, etc.)
3. Western Indian Ocean (Persian Gulf, Gulf of Aden, Arabian Sea)

This prioritisation recognises both the resources constraints that the RNLN faces, as well as looks at the most applicable objectives and missions relevant to Dutch and broader European security interests. With the Russian invasion of Ukraine and persistent instability in North Africa and the Middle East, the Euro-Atlantic area and its approaches is where the primary threat to Europe's maritime security is located. The challenges of defence at sea in this region alone will require a significant amount of attention and investment in the coming years.

This is not to belie any role for the Dutch or other European navies in the Indo-Pacific, where they can play a signalling role alongside partners and allies to underline that their interests are at stake, and the concrete missions in counter-piracy and freedom of navigation they can undertake in regions like the Red Sea and Persian Gulf. Operations such as the EU's *Atalanta* and NATO's *Sea Guardian* remain important tasks for Europe's security. Furthermore, with US attention largely drawn away from the Persian Gulf region and Europe's continued reliance on energy supplies from the Gulf, ensuring a level of European military presence in the region will

be needed for both improved autonomy but also economic security. And if the worst would happen and a war would break out between China and the USA, from a military point of view, it would benefit the U.S. navy far more if it could redeploy American ships from the Red Sea and Persian Gulf to the Western Pacific and see their duties taken over by European ships, than have those same European ships deploy all the way to the Western Pacific.

Second, three areas for capability investment are necessary given the changed maritime security environment: defensive measures against AShMs, the integration of UUVs/USVs/UAVs into naval operations, and the development of improved electronic and physical detection measures. With the continuing development and proliferation of AShMs and unmanned systems, along with robust sensor networks alongside them to improve targeting, surface fleets and port facilities are at significant risk. At the same time, ASW, and amphibious capabilities must not be neglected as they will remain as important as they have always been.

The sinking of the *Moskva* early in the Russo-Ukrainian war, the use of Iranian drones in the Persian Gulf and beyond, and the proliferation of deployed Chinese missiles along vital sea lines of communication in the Indo-Pacific show that the countermeasures identified above are all too necessary. The RNLN's surface platforms and facilities are vulnerable to these new advanced strike capabilities, and existing investments will have to be accelerated and new ones programmed.

Third, on the protection of SLOCs, there are two clearly identifiable roles for the RNLN. One is to contain Russian surface and subsurface forces within the GIUK gap and engage them within the Norwegian and Arctic seas. This role implies a revisitation of operating concepts and platform investments to ensure a mix of surface and submarine capabilities that can function both independently and as part of a multinational / NATO force engaged north of the GIUK line. The other is for the Dutch Marines to support NATO forces in the Arctic and Baltic as they target Russian forces, as explored in more detail in chapter 4 on the use of amphibious forces.

Competing pressures on naval forces imply a flexible procurement and modernisation strategy that can provide for both general purpose use (e.g. frigates) in areas of less immediate interest (i.e. Western Indian Ocean) and more specialised capabilities to counter threats in the most challenging areas, such as unmanned surface systems and electronic warfare countermeasures. As part of this balance, a baseline of survivability to a range of anti-ship threats should be assured given the wider proliferation of advanced capabilities across actors and regions.

For the RNLN, this means a balance between maintaining and modernising existing surface vessels, namely its frigates, and assuring sufficient quantity and capability for *Walrus*-class submarines and their planned replacements. Importantly, an emphasis on interoperability and frequent engagement with allied and partner maritime forces will allow for a more seamless role for the RNLN in broader multinational efforts. SLOC protection is of national interest for the Dutch government, and ensuring a role in this for the Dutch – in conjunction with its allies - is a priority that cannot be overstated.

Fourth and finally, it means finding a balance for the Royal Netherlands Marine Corps between operations as part of NATO's efforts to shore up the defence of the Scandinavian member states – now expanded with Sweden and Finland – and the Baltic member states on the one hand, and the continuing need to be available for anti-piracy, counterterrorist, and humanitarian tasks in the Caribbean, Northern Africa, the Red Sea, and the Persian Gulf.

These main findings and recommendations are summarised below. The topics covered in the essays are comprehensive but not exhaustive. There are several topics not fully addressed in this study that could be examined in future research. First, the structural damage stemming from limited personnel. The RNLN is limited not only by the small number of platforms available to it, but also by the difficulties in attracting personnel for the vessels and to perform the tasks to sustain the naval capabilities. Second, the study does not explicitly discuss another serious constraint on Dutch – and European – capabilities: the decline of European naval industry casts serious doubts on the ability to scale up and to sustain for serious peer to (near) peer competition and possible conflict.

The list of priorities is extensive and the challenge for the RNLN is considerable; yet it is difficult to imagine that the rapid intensification of geopolitical disorder and growing number of threats would not demand a greater role from the Dutch and other navies, specifically in light of the difficulties that the U.S. navy is encountering as long-time guarantor of the global maritime commons.

The Royal Netherlands Navy should:

1. Continue to build on its multinational approach, both through bilateral and minilateral collaborations with its NATO allies, as well as through bilateral, minilateral, and multilateral collaborations with its Indo-Pacific partners.
2. Prioritise the protection of the maritime approaches to Europe with which it maintains access to the US and to the threatened NATO member states, and to the Red Sea and Gulf; practically this means that the NATO Euro-Atlantic region comes first, the Western Indian Ocean second, and then everything else.
3. Invest in ASW assets, particularly submarines, maritime patrol aircraft (MPA) and UUVs/USVs, that can contribute to the network of NATO sensors across the Euro-Atlantic Area and diminish the reliance on American ISR capabilities, particularly in the GIUK gap and the North Sea;
   Invest in general-purpose frigates to conduct patrols in the Western Indian Ocean or Persian Gulf area and to ensure SLOCs between the Indo-Pacific region and Europe can remain open.
4. Invest heavily in defensive measures against aShMs, particularly in electronic warfare countermeasures, to overcome adversary's denial capabilities. Where possible, this should be explored as joint projects within the closest defence partnerships, particularly Germany, the UK, France, and Belgium, to ensure interoperable shipboard systems; this includes experimenting with both electronic and physical deception measures and tools and routinely exercise counter-detection manoeuvres. Where possible, work with industry to understand the level of development of civilian-owned satellite imagery and maritime sensors to ensure shipboard tools can be updated to keep pace with industrial developments.
5. Find space and invest in experiments that integrate UUVs, USVs, and UAVs into both LIVEXs and routine naval manoeuvres. Incorporating such experimentation into longer cruises both inside and beyond the Euro-Atlantic area would be a way to combine activities and maximise both the realism of experiments and resource efficiency.
6. Invest in marine forces that can contribute to multinational amphibious task groups across NATO and the EU's areas of responsibility, while maintaining a robustness to deploy independently to areas of Dutch responsibility (e.g., the Caribbean); organise to optimise for raiding and reconnaissance, and to deliver units from the ship to shore with connectors;
   Invest in connectors with long range and high speed to allow for stand-off capability in denial-heavy areas;
   Invest in amphibious ships with the speed and the range to operate as part of fast battlegroups.

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