



## REPORT

# TO THE SEAS AGAIN

## MARITIME DEFENCE AND DETERRENCE IN THE BALTIC REGION

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## ABOUT THE EXTERNAL AUTHORS

### HEINRICH LANGE

Vice Admiral (retired) Heinrich Lange joined the German Navy in 1974 as an officer cadet and served for more than 40 years before retiring in 2015. He was a surface warfare officer on fast patrol boats, in all command roles up to Commander of the Fast Patrol Boat Flotilla in Rostock, where he was responsible for transforming the flotilla to take its present position in the force structure of the German Navy. He also gained further experience in conceptual and strategic issues in the German Ministry of Defence and at NATO Headquarters in Brussels.

On promotion to admiral in 2005, he took command of the German Naval Academy in Flensburg. His further flag assignments have included Commander Task Force 150 in Operation Enduring Freedom off the Horn of Africa, head of the Plans and Programs Division of the Armed Forces Staff at the Ministry of Defence in Bonn, Vice Chief of the German Navy, and finally Director for Armed Forces Readiness at the Ministry of Defence in Berlin.

His education includes a Master of Science in Economics from the German Armed Forces University in Hamburg, a Master of Science in Operations Research from the US Naval Postgraduate School in Monterey, California, and higher education at the German Command and Staff College in Hamburg.

### BILL COMBES

William “Bill” Combes, CAPT USN (retired) is a Lecturer in the Department of Leadership and Management at the Baltic Defence College in Tartu, Estonia. Before moving to Estonia, Bill completed a 27-year career in the US Navy as a submariner and strategist. In addition to commanding a ballistic missile submarine, serving as Chief of Staff of a carrier strike group deployed to the Persian Gulf, and his last position as the branch head for US Navy strategy in the Pentagon, he was the US Navy’s Fellow to Oxford University and the Changing Character of War Programme.

The Baltic Defence College ([www.baltdefcol.org](http://www.baltdefcol.org)) is an English-speaking international institution of Estonia, Latvia and Lithuania providing professional military education at the operational and strategic levels for military and civilian leaders of the Baltic states, their allies and partners. The college conducts applied research, hosts and co-hosts conferences and seminars and offers a fellowship programme. At the college Bill lectures, researches and supervises student studies in leadership, management, energy security, maritime security, and other military and strategic studies topics.

## EXECUTIVE SUMMARY

This report concerns the maritime aspects of defence and deterrence in the Baltic Sea region. Access to the Baltic Sea is of vital economic interest to its littoral states, including Russia. Large numbers of vessels convey substantial trade volumes, including energy products, through its waters each day, while a significant number of critical infrastructure links lie below its surface.

The operating environment is complex. The Baltic Sea is confined and shallow. Its winding shape includes several bottlenecks, and its numerous islands confine major shipping to certain channels. Its unusual hydrology, frequent adverse weather conditions and ice, and the presence of large quantities of discarded ordnance complicate naval operations. The short distance of the sea from airfields and the potential operating locations of land-based military capability, including electronic warfare and cyber assets, further complicates the employment of naval force. This environment demands a particular set of professional skills and knowledge.

Although the environment may be unusual, the full set of maritime warfare disciplines can be executed in the Baltic Sea and all – amphibious warfare, mine-laying, anti-surface warfare, anti-submarine warfare, mine-clearance operations, and anti-air warfare – are required to one degree or another. Command, control, communications, computer, intelligence, surveillance and reconnaissance systems are also required to evaluate threats, and direct or coordinate action; while the confines of time and space and the need to react rapidly to developments make full, real-time maritime situational awareness a key requirement for naval forces in this region.

The only plausible military challenges to the navies of the states surrounding the Baltic Sea come from Russia. In peacetime, the Russian Navy attempts to exert undue influence in the Baltic and behaves provocatively towards Allied shipping and other Allied interests. In pre-crisis and crisis, the confined and shallow nature of the Baltic, the volume of traffic it typically contains, and its economic and social importance to all the surrounding states present multiple opportunities for hybrid actions; perhaps the most likely form of Russian challenge in the Baltic maritime domain. In wartime, the Baltic Sea would be a vital reinforcement and resupply route for NATO's defence efforts.

It is thus essential that NATO continues – and enhances – its naval presence in the Baltic Sea in peacetime to deter Russia. But it is also necessary for the states bordering the Baltic Sea to do more to secure their maritime environment. Local expertise and continuous presence at sea to ensure situational awareness and the recognition of unusual patterns are necessary to identify hybrid actions; and a range of means to allow an effective and timely response to these actions is also required.

In times of crisis, NATO will be heavily engaged in the protection of transatlantic sea lines of communication and in preventing Russia from accessing the Atlantic. The deployment to the Baltic of warships primarily designed for blue water operations should be regarded as a possibility, rather than as a certainty to be relied upon. The states surrounding the Baltic Sea will thus need to be able to establish and maintain sea control to protect Baltic Sea routes, ports and other critical infrastructure, to counter amphibious operations and to disrupt the actions of the Baltic Fleet. The capabilities required to achieve these tasks are not fully in place; neither are the arrangements for cooperation among the Baltic Sea states that are necessary to enhance efficiency and effectiveness.



We therefore recommend that:

### NATO should:

- continue to monitor Russian naval developments;
- place greater emphasis on the threats posed by hybrid maritime operations and explore possible means to counter them;
- place greater emphasis in their strategic messaging on Russia's substantial economic dependence on the Baltic Sea, and its vulnerability to the disruption of trade flows in the region;
- continue to deploy and exercise principal surface combatants on the Baltic Sea;
- enhance its overall naval presence in the Baltic, in particular in the eastern Baltic;
- ease force generation problems for deterrence operations by reorganising its exercise programme;
- increase the number of naval staff officers at Joint Force Command Brunssum; and
- regularly exercise the augmentation of Maritime Command and the deployment of its deployable elements.

### The Baltic Sea states should:

- ease force generation problems for deterrence operations by exploring options to improve maritime military mobility;
- investigate options to enhance connectivity between their own command, control, communications, computer, intelligence, surveillance and reconnaissance systems networks and visiting warships to provide for better training opportunities in the region;
- recognise their role in countering hostile Russian maritime activity, and the requirement that will be placed on them to establish sea control, in times of crisis;
- take the steps necessary to enhance the readiness of their maritime response and ensure that this issue remains prominent on NATO's agenda;
- enhance their maritime situational awareness, including through more presence at sea;
- identify appropriate frameworks to develop habits of close cooperation in all aspects of activity related to the maritime domain, in order to be able to respond effectively and efficiently to wartime threats, hybrid threats, and hostile activity in peacetime;
- create a Baltic Maritime Group, outside but closely associated with NATO structures, to provide an operating framework for the Baltic Sea navies. It would provide persistent presence, enhance deterrence and be a framework for training and exercises;
- ensure that decision makers are included in meaningful roles in maritime domain exercises to raise awareness and counter sea blindness;
- recognise the importance of cooperation between naval and constabulary maritime force in countering hybrid threats, and take steps to improve inter-agency cooperation;
- raise the issue of data sharing to the political-military level (or national equivalents for interagency sharing) in order to improve the prospects for enhancing current sharing arrangements;
- treat as a priority the secondment of staff officers to Maritime Command's Baltic Sea regional maritime coordination function;
- offer their fullest support both politically, and practically to the building of the Baltic Maritime Component Command;
- ensure that technical solutions for data sharing are in place and regularly exercised, even if there are obstacles to day-to-day sharing; and
- acquire the capabilities to be able to at least detect and identify with radar and visual means all Russian naval ships as they transit through their Exclusive Economic Zones

### Germany should:

- commit fully to the leadership role necessary to build the Baltic Maritime Component Command into a structure for effective regional coordination in peacetime and command and control in crisis;
- regularly exercise the augmentation of the Baltic Maritime Component Command and the deployment of its deployable elements; and
- make special efforts to involve Finland and Sweden in the Baltic Maritime Component Command.

### The Baltic states should:

- continue to operate and improve their mine countermeasure capability;
- invest in mine-laying capabilities to protect key infrastructure from attack from the sea and deny access to other vital areas;
- invest in small, multi-purpose naval vessels to provide capabilities for anti-submarine and anti-surface warfare, command and control, and enhanced maritime situational awareness;
- in order for multi-purpose vessels to be affordable, acquire, command and operate them on a common basis;
- consider where unmanned vehicles can be used alongside multi-purpose vessels to complement the capabilities these platforms offer; and
- consider also investing in land-based coastal defence missiles, to secure sea lines of communication and protect coastlines.

## LIST OF ABBREVIATIONS

A2/AD	Anti-Access/Area-Denial
AAW	Anti-Air Warfare
ASW	Anti-Submarine Warfare
ASuW	Anti-Surface Warfare
BMCC	Baltic Maritime Component Command
C2	Command and Control
C4ISR	Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance
CSDP	Common Security and Defence Policy
EEZ	Exclusive Economic Zone
eFP	Enhanced Forward Presence
E-PINE	Enhanced Partnership in Northern Europe
EW	Electronic Warfare
GIUK	Greenland-Iceland-United Kingdom
ISR	Intelligence, Surveillance and Reconnaissance
JEF	Joint Expeditionary Force
JFCBS	Joint Force Command Brunssum
LNG	Liquefied Natural Gas
MARCOM	Maritime Command
MCM	Mine Countermeasures
MPA	Maritime Patrol Aircraft
MSA	Maritime Situational Awareness
NB6/8	Nordic Baltic 6/8
nm	Nautical mile (1.85 km)
NORDEFCO	Nordic Defence Cooperation
RMP	Recognised Maritime Picture
SAR	Search and Rescue
SLOC	Sea Line of Communication
SNMG1	Standing NATO Maritime Group One
SNMCMG1	Standing NATO Mine Countermeasures Group One
SUCBAS	Sea Surveillance Co-Operation Baltic Sea
SUCFIS	Sea Surveillance Co-Operation Finland Sweden
TEU	Twenty foot Equivalent Unit
TTW	Territorial Waters
UUV	Unmanned Underwater Vehicle
VBSS	Visit, Board, Search and Seizure
VJTF	Very High Readiness Joint Task Force

### A NOTE ON TERMINOLOGY

In this report, we use the term ‘Baltic states’ to refer to the three Baltic states of Estonia, Latvia and Lithuania, and the term ‘Baltic Sea states’ to refer to the Western states that have Baltic Sea coastlines: the three Baltic states, Denmark, Finland, Germany, Poland and Sweden. We do not include Russia, a Baltic Sea state by virtue of geography, in this definition.



*I must go down to the seas again,  
to the lonely sea and the sky,  
And all I ask is a tall ship and a star to steer her by*

From Sea Fever, John Masefield, 1902

## INTRODUCTION

This report concerns the maritime aspects of defence and deterrence in the Baltic Sea region. NATO's navies were somewhat neglected in the decades following the end of the Cold War as the Alliance turned its focus towards crisis response operations in which, apart from some specific counter-piracy efforts, maritime concerns were secondary. But in the post-Crimea era, as NATO has placed renewed emphasis on its core mission of collective defence, attention is once more being paid to the maritime domain. As NATO's Brussels Summit Declaration states:

*Attention is once more being paid to the maritime domain*

We are reinforcing our maritime posture and have taken concrete steps to improve our overall maritime situational awareness. We have prepared strategic assessments on the Baltic and Black Seas, the North Atlantic, and the Mediterranean. Through an enhanced exercise programme, we will reinvigorate our collective maritime warfighting skills in key areas, including anti-submarine warfare, amphibious operations, and protection of sea lines of communications. The posture will also ensure support to reinforcement by and from the sea, including the transatlantic dimension with the North Atlantic being a line of communication for strategic reinforcement.<sup>1</sup>

The Alliance is both rediscovering old situations and discovering new ones. The present emphasis on the key role of navies in ensuring that Europe

can be safely reinforced from the United States and Canada through the protection of sea lines of communication (SLOCs) and the defence of the Greenland-Iceland-United Kingdom (GIUK) gap, for example, is reminiscent of Cold War concepts.<sup>2</sup> By contrast, the strategic situation of the Baltic Sea has almost entirely reversed compared to the Cold War period – a sea bounded by the Soviet Union, the Warsaw Pact, and non-aligned countries with Denmark and West Germany as front-line states has become one almost entirely located within the territories of the European Union, but in which Russia retains a military and commercial presence that

*While progress is being made in enhancing maritime security in the Baltic Sea, there is a great deal still to be done*

far outweighs its minimal geographic presence. While progress is being made in enhancing maritime security in the Baltic Sea, there is a great deal still to be done, both in identifying and acquiring capabilities and in advancing thinking.

Our report has been prepared following extensive discussions with officials, military personnel and experts in Denmark, Estonia, Finland, Germany and Sweden, at NATO's Maritime Command, Northwood, UK, and at the NATO Centre of Excellence for Operations in Confined and Shallow Waters, Kiel, Germany. In order to encourage frank discussions, our interlocutors were guaranteed anonymity; their views and comments, while frequently reflected throughout our report, are not individually attributed.

In the first section of our report, we briefly describe the strategic context of the Baltic region, the economic importance of the Baltic Sea to its surrounding states, and the maritime operating environment peculiar to the Baltic Sea. Section two describes in broad terms the capabilities required by the navies of the Baltic Sea states to respond to challenges in the particular operating environment of the Baltic. In section three, we describe the challenges that

<sup>1</sup> NATO, "Brussels Summit Declaration. Issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Brussels 11-12 July 2018," Press Release (2018) 074, 11 July 2018, paragraph 19.

<sup>2</sup> Julianne Smith and Jerry Hendrix, *Forgotten Waters: Minding the GIUK Gap (A Tabletop Exercise)* (Washington DC: Center for a New American Security, 2017), 3.

Russia, the only conceivable source of military threat to the other states of the region, poses in the maritime domain. Finally, in section four we set out our key findings and make recommendations.

Our report also has two substantive Annexes. Annex A provides a survey of the postures and capabilities of the navies of the states surrounding the Baltic Sea. Annex B provides a background introduction to maritime security, describing the functions it entails and the agencies typically responsible for their execution. A final Annex, Annex C, contains a full list of references.

## 1. STRATEGIC CONTEXT

In this opening section of our report, we set out the overall geopolitical situation of the Baltic Sea region, and the importance of the Baltic Sea to the economies of the surrounding states and those of their trading partners worldwide. We also describe the challenging operating environment of the Baltic Sea, which arises from a combination of physical attributes and human activities.

### 1.1 THE BALTIC REGION

The present-day strategic complexity of the Baltic Sea region arises from the geopolitical arrangements that have developed there since the end of the Cold War. Denmark, Estonia, Germany, Latvia, Lithuania and Poland are NATO members, committed to collective defence through Article 5 of the North Atlantic Treaty, while Finland and Sweden have developed close cooperation with the Alliance as Enhanced Opportunities Partners (EOP). All the Baltic Sea states, with the exception of Russia, are members of the EU, bound by the solidarity and mutual assistance clauses of the Treaties of the European Union. The Nordic countries also form a tightly knit defence cooperation community through the Nordic Defence Cooperation (NORDEFCO) framework that increasingly ties in the Baltic states. The Nordic-Baltic Eight cooperation format, which includes the five Nordic and three Baltic states, also addresses security issues in the region. The Northern Group, which includes non-

regional partners such as the United Kingdom and the Netherlands, has meanwhile emerged as an important political forum for defence cooperation among the Baltic Sea countries. The US has also been heavily involved in the regional security of the Baltic Sea through strong bilateral relations and multilateral initiatives such as the Enhanced Partnership in Northern Europe (E-PINE) and the European Deterrence Initiative. The Baltic region is thus at the centre of a dense web of close political, security and defence cooperation networks (Figure 1).

However, the initial hopes of the 1990s that Russia could become a close cooperation partner and a benign security actor in the region, for example as a member of the Council of the Baltic Sea States and a special partner

*The Baltic region is at the centre of a dense web of close political, security and defence cooperation networks*

of NATO and the EU have been dashed. These prospects began to decline in the mid- to late-2000s, in particular in the wake of the 'Bronze Soldier' crisis in Estonia in 2007 and the Russia-Georgia War in 2008. Concerns about Moscow's great power ambitions and its willingness to use military force and other means of coercion to reassert its influence were mostly confined to the Baltic states, which actively pressed NATO to develop contingency plans for the defence of their territories. Russia's illegal annexation of Crimea and invasion of the Donbass region of Ukraine in 2014 were game changers not only for the Baltic region, but also for Europe

*Russia is the only conceivable existential threat to the sovereignty of the states surrounding the Baltic Sea*

and the transatlantic area. The Baltic Sea, a geographical space where the West and Russia come into very close contact, is now a theatre of confrontation in the adversarial relationship between these two parties.<sup>3</sup> While the threat

<sup>3</sup> For a recent survey of the security dynamics of the region, see John Andres Olsen, ed., *Security in Northern Europe: Deterrence, Defence, and Dialogue*, RUSI Whitehall Papers, 93 (London: RUSI, 2018).

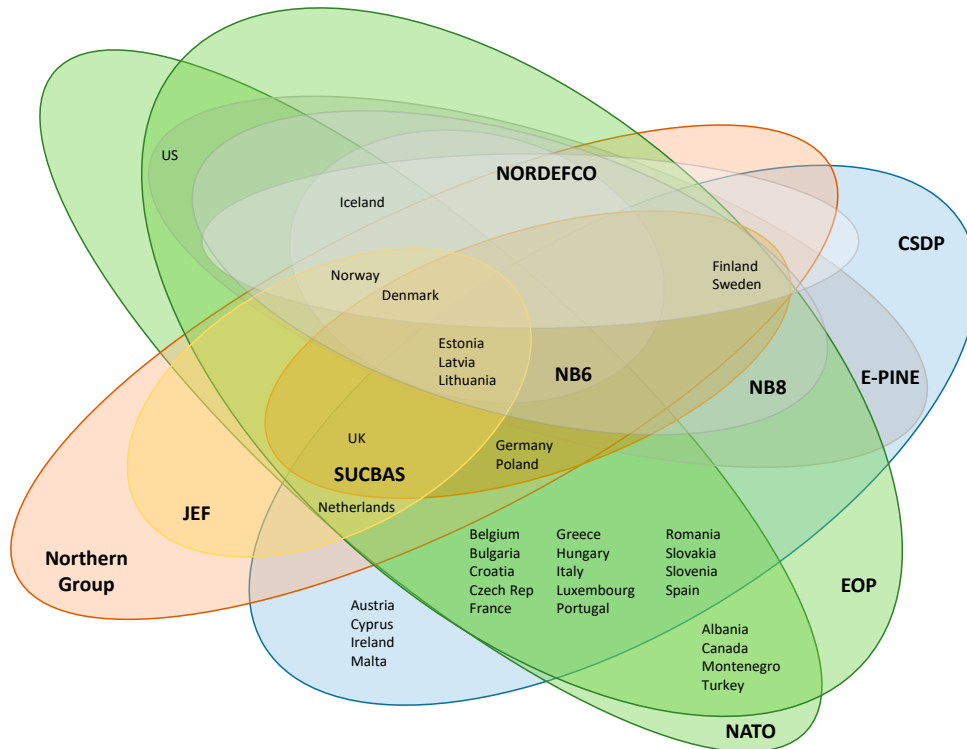


Figure 1. Baltic Region Security Arrangements

of a direct Russian military attack is low, Russia is the only conceivable existential threat to the sovereignty of the states surrounding the Baltic Sea.<sup>4</sup> Prudent defence planning requires that this possibility be taken very seriously; as should Russia's ability to challenge the Allies with so-called hybrid (sometimes known as gray-zone) threats which employ a mix of conventional weapons, irregular tactics, terrorism and criminal behaviour in the battle space to achieve political objectives.<sup>5</sup>

For the Alliance then, maintaining visible and continuous military presence and preserving unimpeded access to the Baltic states by air, land and sea have become key to bolstering the credibility of deterrence; and, should deterrence fail, to ensuring NATO's ability to defend or restore the sovereignty of the Baltic states. In the maritime domain, this requires the capability to establish sea control in the Baltic in times of crisis or war

to preserve SLOCs.<sup>6</sup> The hard geostrategic fact is that the Baltic states are connected to the rest of the Alliance only by a narrow piece of land, the so-called Suwałki corridor. Securing this corridor in a crisis or war would present NATO with a major challenge. The only alternative routes to bring reinforcements to and resupply them in the region are through the Baltic Sea and in the airspace above.<sup>7</sup> Of these, only the sea offers the realistic means to do so on a large scale.

*For Russia, maintaining open SLOCs between Saint Petersburg and Kaliningrad and denying sea control to NATO in a conflict, would be crucial strategic considerations*

<sup>4</sup> Välisluureamet (Estonian Foreign Intelligence Service), *International Security and Estonia 2019* (Tallinn: Välisluureamet, 2019), 4.

<sup>5</sup> Frank G. Hoffman, *Conflict in the 21<sup>st</sup> Century: The Rise of Hybrid Wars* (Arlington: Potomac Institute for Policy Studies, 2007), 14.

<sup>6</sup> Sea control refers to the employment of military forces to "destroy enemy naval forces, suppress enemy sea commerce, protect vital sea lanes, and establish local military superiority in vital sea areas" with the intent of securing the maritime domain and preventing its use by the enemy. Sea denial refers to attempts to deny an enemy's ability to use the sea without necessarily attempting to control it. Joint Chiefs of Staff, *Command and Control of Joint Maritime Operations, Joint Publication 3-32* (Washington DC: Joint Chiefs of Staff, 2018), I-3, GL-7.

<sup>7</sup> Ben Hodges, Janusz Bugajski and Peter B. Doran, *Securing the Suwałki Corridor: Strategy, Statecraft, Deterrence and Defense* (Washington DC: Center for European Policy Analysis, July 2018), 16.

However for Russia, maintaining open SLOCs between Saint Petersburg and Kaliningrad and denying sea control to NATO in a conflict, would be crucial – and competing – strategic considerations.

## *The Baltic Sea is of vital economic importance to its littoral states, including Russia*

### 1.2 THE ECONOMIC IMPORTANCE OF THE BALTIC SEA

The Baltic Sea is of vital economic importance to its littoral states, including Russia. The economic prosperity and sense of security of millions of people in the Baltic region depend, to a large extent, on access to and freedom of navigation on this body of water. Its ports handled 881 million tonnes of cargo in 2016, while 40 million passengers cross it annually by ferry. These numbers are increasing each year.<sup>8</sup> The economic importance of the Baltic is also reflected in the number of vessels afloat there at any given moment – typically around 2000.<sup>9</sup> Despite some areas of heavy pollution and declining stocks, the Baltic is still important as a fisheries resource to the surrounding states.<sup>10</sup> Further, it has environmental and recreational value. For example, for a number of years the Estonian public has consistently ranked a large-scale oil spill or marine pollution caused by a shipping disaster to be among their top five national security concerns.<sup>11</sup>

The three Baltic states of Estonia, Latvia and Lithuania, as well as Finland are particularly dependent on the Baltic Sea because of their geography, infrastructural constraints and the direction of trade flows. Some Finnish officials even refer to their country as a semi-island – if access to Finland through the Baltic Sea were severed or constrained, the capacity of land

routes and associated infrastructure through Sweden and Norway would not be sufficient to compensate. Meanwhile, the two roads and one railway line connecting the Baltic states with the rest of the EU are also nowhere near providing sufficient capacity for the growing north-south flows of goods and people. According to Swedish officials, although Sweden has direct access to the North Sea, it would struggle to maintain trade flows via Norway and through the only harbour on its west coast, Gothenburg, if Baltic Sea shipping routes were obstructed. Further afield, even land-locked Belarus partly relies on transit through the Baltic Sea ports to bring some of its most important industrial and agricultural products, such as petroleum, petrochemicals, fertilisers, machinery, and grain to its export markets.<sup>12</sup>

## *Energy security in the region, especially of the Baltic states, is substantially reliant on the Baltic Sea*

Energy security in the region, especially of the Baltic states, is also substantially reliant on the Baltic Sea. For example, for cost efficiency reasons Estonia keeps about half of the strategic petroleum reserves it is required to hold by EU law in Sweden, making access to the Baltic Sea even more pertinent in national emergencies that may call for the use of these reserves.<sup>13</sup> All the crude oil supplied to Lithuania's Mazeikiai refinery – a major source of petrol, gas, aviation fuel and heavy fuel in the Baltic states – has arrived by sea since Russia closed a branch of the *Druzhba* oil pipeline in 2006 as a means of pressuring the Lithuanian government to sell its stake in the refinery to a Russian oil company.<sup>14</sup> Diversification of the natural gas supply from Russia entails the use of sea routes to ship liquefied natural gas (LNG) to a floating terminal facility in Klaipėda port in Lithuania, and ever

<sup>8</sup> Marek Błus, "Rising Again," *Baltic Transport Journal*, 2:76 (2017), 45-47; Helsinki Commission (HELCOM), *HELCOM Assessment on maritime activities in the Baltic Sea 2018* (Helsinki: Helsinki Commission, 2018), 51.

<sup>9</sup> Magdalena Matczak, *QUO VADIS: Exploring the future of shipping in the Baltic Sea* (Baltic LINes, 2016), 8.

<sup>10</sup> Helsinki Commission (HELCOM), "Fisheries," HELCOM, <http://www.helcom.fi/action-areas/fisheries>.

<sup>11</sup> In Autumn 2018, 53% of respondents considered it either a very serious or rather serious threat to the national security of Estonia. Juhan Kivirähk, *Availik arvamus ja riigikaitse* (Public opinion and national defence) (Tallinn: Kaitseministeerium (Ministry of Defence), 2018), 23.

<sup>12</sup> Siarhei Bohdan, "Ever narrower access to the sea undermines Belarusian sovereignty," *Belarus Digest*, 22 January 2018, <https://belarusdigest.com/story/ever-narrower-access-to-the-sea-undermines-belarusian-sovereignty/>.

<sup>13</sup> Ando Leppiman, Undersecretary of the Estonian Ministry of Economic Affairs and Communications, "Energy Security of the Baltic States," seminar at the Estonian School of Diplomacy, 12 December 2018.

<sup>14</sup> J. Augutis, V. Matuziene, R. Krikstolaitis and E. Ušpuris, "Analysis of energy supply disturbances in Lithuania," *WIT Transactions on Information and Communication Technologies*, 39 (2008): 301.

more LNG infrastructure projects are planned or under construction in the Baltic Sea.<sup>15</sup> Off-shore wind farms are also becoming an increasingly important source of renewable energy for countries such as Denmark and Germany, with others likely to follow suit.<sup>16</sup>

Reliance on the Baltic Sea extends below the surface with a significant number of critical infrastructure links, including submarine power

## *Russia's economy is also highly dependent on the Baltic Sea*

and data cables, and gas pipelines connecting the surrounding states. Broadband internet traffic between the Baltic states and Finland (and even parts of Russia) and the rest of the world is mostly directed through fibre optical cables laid under the Baltic Sea to Scandinavia and Germany.<sup>17</sup> The functioning of the Baltic states as part of the NordPool Spot electricity market depends on the EstLink 1 and 2 and NordBalt undersea power cables between Estonia and Finland and between Lithuania and Sweden respectively. Future synchronisation of the Baltic states' power grids with the continental European grid will partly rest on an additional power cable laid between Poland and Lithuania.<sup>18</sup> Undersea gas pipelines between Poland and Denmark (approved) as well as between Estonia and Finland (under construction) will be critical to the functioning of integrated European and regional gas markets.<sup>19</sup>

A point that is perhaps overlooked is that Russia's

economy is also highly dependent on the Baltic Sea. The following statistics illustrate this:

- in 2017 Russia moved around one-third of its total seaborne cargo – 247 million tonnes, including 142 million tonnes of liquid bulk cargo (i.e. crude oil and oil products) – through its Baltic ports of Saint Petersburg, Primorsk, Vysotsk, Ust-Luga and Kaliningrad;
- around 3.3 million barrels of crude oil and petroleum products pass through the Danish Straits each day, equivalent to the level of trade through Suez or Bab-el-Mandeb, and making the Straits a major global strategic oil transit chokepoint;
- Russia's container throughput in the Baltic grew more than sevenfold between 2000 and 2017, from 306 000 twenty foot equivalent units (TEU) to 2 230 000 TEUs (a little over half of Russia's total container traffic of 4 429 000 TEUs);
- the Nord Stream undersea gas pipeline, which traverses the Exclusive Economic Zones (EEZ) of Finland, Sweden, Denmark, and Germany on its route from Vyborg to Germany carried 58.8 billion cubic metres of gas in 2018. This flow will substantially increase when Nord Stream 2 construction is completed; and
- although most of the supply of the Kaliningrad exclave is conducted overland through Belarus and Lithuania, there is a growing reliance on seaborne flows of trade and supplies between Russia's mainland and its exclave. For instance, in 2018 Russia opened a new floating LNG terminal in Kaliningrad to ensure security of gas supply should the overland route become unavailable.<sup>20</sup>

<sup>15</sup> Bartosz Bielszczuk, "LNG Developing Rapidly in the Baltic Sea Region," *PISM Bulletin* 46 (986) (2017), 1.

<sup>16</sup> Wind Europe, *Offshore Wind in Europe: Key trends and statistics 2017* (Brussels: Wind Europe, February 2018), 18, 24-25.

<sup>17</sup> Brian Lavallée, "Northern Europe Goes Dark, and It's a Good Thing," *Ciena*, 17 May 2017, <https://www.ciena.com/insights/articles/Northern-Europe-Goes-Dark-and-Its-a-Good-Thing.html>.

<sup>18</sup> Emmet Tuohy, et al., *The Geopolitics of Power Grids: Political and Security Aspects of Baltic Electricity Synchronisation* (Tallinn: International Centre for Defence and Security, 2018), 39-40, 75.

<sup>19</sup> European Union, European Commission, "Investing in infrastructure that unites: first gas interconnector between Finland and Estonia ends energy isolation," European Commission, <https://ec.europa.eu/energy/en/news/investing-infrastructure-unites-first-gas-interconnector-between-finland-and-estonia-ends-energy-isolation>; Baltic Pipe Project, "Final investment decisions for the Baltic Pipe are made," Baltic Pipe Project, 30 November 2018, <https://www.baltic-pipe.eu/final-investment-decisions-for-the-baltic-pipe-are-made-3/>.

<sup>20</sup> "Throughput of Russian seaports in 2017 grew by 9% to 786.97 mln t (detalization)," *PortNews*, 12 January 2018, <http://en.portnews.ru/news/251819/>; Ministry of Defence (UK), Development, Concepts and Doctrine Centre, *Future Security Challenges in the Baltic Sea Region* (Shrivenham: DCDC, 2015), 3; Global Ports, "Key Russian Gateways," Global Ports, <http://www.globalports.com/globalports/about-us/our-industry-overview/container-market/key-russian-gateways>; Nord Stream AG, "A Record Volume of 58.8 Billion Cubic Metres of Natural Gas Has Been Transported through The Nord Stream Pipeline in 2018," Nord Stream AG, 18 January 2019, <https://www.nord-stream.com/press-info/press-releases/a-record-volume-of-588-billion-cubic-metres-of-natural-gas-has-been-transported-through-the-nord-stream-pipeline-in-2018-504/>; "Putin hails energy security boost from Russia's first LNG floating storage," *Reuters*, 8 January 2019, <https://www.reuters.com/article/us-russia-gazprom-putin-kaliningrad/putin-hails-energy-security-boost-from-russias-first-lng-floating-storage-idUSKCN1P216F>.



The socio-economic importance of the Baltic means that events and activities at sea can have significant effects on the land and in the minds of the societies of the surrounding states. This attribute could be exploited for malicious purposes, such as eroding the resilience of societies and undermining their sense of

*Events and activities at sea can have significant effects on the land and in the minds of the societies of the surrounding states*

security. An adversary can create undesirable political and security effects without deliberately crossing the threshold of open conflict or directly violating the sovereignty and territorial integrity of the littoral states. NATO's cohesion and the EU's solidarity could be challenged – as well as buttressed – by their understanding of and actions on the Baltic Sea as much as they could in other domains. It is clearly preferable that NATO and the EU should shape the regional environment, rather than allow it to be shaped by the strategy, concepts and modus operandi of Russia – a hostile geopolitical player with a geographically narrow access to, but a large military footprint in the Baltic Sea.

*The Baltic Sea is a complex operating environment presenting its own difficulties and challenges*

### 1.3 THE OPERATING ENVIRONMENT OF THE BALTIC SEA

The description of the Baltic Sea commonly used by ocean-going naval personnel – that it is not a sea at all, but a 'flooded meadow' – is clearly not intended to be taken too seriously. It teases Baltic sailors that, compared to their counterparts on the high seas, they operate in a homogeneous and unchallenging environment. It is true that compared to the oceans, the Baltic Sea looks more like a lake. But the Baltic is a complex operating environment presenting its own difficulties and challenges.

#### 1.3.1 THE PHYSICAL ENVIRONMENT

The Baltic Sea (Figure 2) is small, with a total surface area approximately 1.5 times that of

the US Great Lakes. Its maximum north-south extension amounts to less than 1 400 km, while its east-west extension, even when the Kattegat between Denmark and Sweden is included, is only around 1 000 km. It reaches its maximum depth of 459 metres in the Gotland basin, but in the Gulf of Finland the average depth is only 38 metres, and just 26 metres in the Gulf of Riga. There are also extended areas where the depth is less than 20 metres.

The Baltic is far from being a homogeneous sea. The shallow western Baltic Sea differs greatly from the deeper central Baltic Sea, which differs again from the complex northern Baltic Sea. Furthermore, the waters of the Baltic Sea are confined: many of its shorelines are jagged and rugged, and scattered with small islands and other navigational hazards. Its passages are narrow and lead to traffic being channelled through bottlenecks such as the Danish Straits, the Gulf of Riga, the Gulf of Finland and the Gulf of Bothnia. The environment may thus be described as confined and shallow, or littoral, and operations here are confined in both time and space.

The Baltic Sea drains through the Danish Straits and takes in some saltwater in exchange for a surface layer of brackish water which discharges into the North Sea. The more saline intake forms a sub-surface layer, resulting in a salinity gradient from top to bottom, with most of the salt water remaining below 50 metres. The salinity of the water also decreases from higher concentrations in the west to lower ones in the east and north. This unusual hydrology adversely affects the performance of underwater sensors. Some of the sea is well oxygenated, but other parts are poor, which impacts negatively on biology and fishery activities.

The weather in the Baltic Sea is mainly driven by the European continental climate, resulting in warm summers and cold winters. However, the Atlantic climate also impacts Baltic weather, often resulting in strong and sudden storms due to large transient temperature differences and the long fetch of wind. Average wave height varies between 0.5 and 2 metres, but waves can reach 7 metres in the Central Baltic (also referred to as the 'Baltic Proper') with individual waves





Figure 2. The Baltic Sea

reaching heights of 12 metres or more. There are no significant tidal impacts, but strong winds

*Ice severely impacts commercial shipping and naval operations and is a major consideration for both ship design and maritime operations*

regularly produce a so-called ‘bathtub-effect’ by pushing the water towards one area to create local flooding, followed by backwards flushes as the wind decreases or changes direction.

Cold winters lead to severe icing in the Baltic Sea. On average, about 40% of the surface

area is covered with ice in winter, mainly in the northern and north-eastern parts of the sea, although the maximum extent of ice cover has shrunk in recent years, and is expected to continue to do so.<sup>21</sup> Nonetheless, ice severely impacts commercial shipping and naval operations and is a major consideration for both ship design and maritime operations.

<sup>21</sup> Finnish Meteorological Institute, “Ice winter in the Baltic Sea,” Finnish Meteorological Institute, <https://en.ilmatieteenlaitos.fi/ice-winter-in-the-baltic-sea>; European Union, European Environment Agency, “Arctic and Baltic sea ice,” European Environment Agency, <https://www.eea.europa.eu/data-and-maps/indicators/arctic-sea-ice-3/assessment>.

The Baltic Sea contains numerous islands and archipelagos of different sizes and types. There are larger islands close to the shorelines, such as Fehmarn, Rügen, Øland and Saaremaa, and islands such as Bornholm and Gotland located in the deeper waters. Many of the smaller islands form larger archipelagos, such as the Danish islands, the Stockholm archipelago and the Finnish archipelago; others, such as Christiansø (Denmark), Gotska Sandöen (Sweden) and Gogland (Russia), are more isolated.

The geography of the sea means that major commercial shipping is confined to channels through its bottlenecks and winding shape. The majority of larger ships enter or leave the Baltic Sea through the Danish Straits; the narrow Femern Belt between Germany and Denmark and the Øresund between Denmark and Sweden are the only two ways for most traffic to enter or exit the central Baltic Sea. Both these passageways are extremely busy and thus intensively controlled and surveyed. The major traffic route to/from Bornholm is similarly closely controlled. From there, traffic routes divide and spread – towards the Gdansk Bight, Lithuania, the Gulf of Riga, the Gulf of Finland and Stockholm/the Gulf of Bothnia. The entrances to the Gulfs of Riga, Finland and Bothnia are also physical bottlenecks, but again important trade routes. The Kiel Canal, linking the Baltic Sea to the Elbe, and the White Sea Canal, linking St Petersburg to Belomorsk, are the only other entry points.

The Baltic's bottlenecks and islands also offer both challenges and opportunities. Bottlenecks and islands permit the ready and complete surveillance of the local maritime situation; at the same time, the complex geography of the Baltic archipelagos disallows effective, permanent surveillance and offers opportunities to hide nefarious activities. Bottlenecks may also be blockaded to gain local sea control or to establish sea denial against an opponent.

### 1.3.2 THE HUMAN ENVIRONMENT

From a legal viewpoint, most of the Baltic Sea is claimed as the EEZs of the surrounding states under the UN Convention on the Law of the

Sea. While the living and non-living resources of the Baltic Sea belong to specific states, the main SLOCs are outside territorial waters (beyond 12 nautical miles from shore) and are therefore considered to be international waters for the purposes of high seas freedom

*In the Baltic states, only a limited number of the many ports can receive the roll-on/roll-off cargo vessels used to transport large-scale reinforcements by sea*

of navigation.<sup>22</sup> Both economic control and freedom of navigation need to be exercised and maintained. Freedom of navigation in the Baltic Sea is regularly demonstrated by naval exercises such as the US-led *BALTOPS*.

In terms of infrastructure, there are numerous ports and harbours around the Baltic with ever increasing trade volumes. A point often overlooked is that many of them have specialised their infrastructure towards the one major commodity being shipped through their location. This phenomenon is not restricted to the Baltic Sea, but indicates a wider lack of redundancy that might cause problems if one or more ports are blocked, attacked, or otherwise not operational. In the Baltic states, for example, only a limited number of the many ports can receive the roll-on/roll-off cargo vessels used to transport large-scale reinforcements by sea.

*A substantial amount of ordnance with an uncertain status remains on the seabed*

As pointed out earlier, the many links between the countries bordering the Baltic Sea have also led to a considerable network of undersea communication cables, powerlines and pipelines. The growing number of offshore wind farms further complicates the surface picture, especially in the western parts of the Baltic Sea. Together with the ports they constitute critical infrastructure in need of protection.

<sup>22</sup> A coastal state's territorial waters are normally defined as 12 nautical miles (nm) from its coastline or approved baseline. The high seas are those seas outside territorial waters. Coastal states also have exclusive economic rights out to 200 nautical miles – the EEZ – which may be extended further if it can be proved that the continental shelf of the coastal state extends beyond 200 nm. Donald Rothwell, and Tim Stephens, *The International Law of the Sea* (Oxford, Portland, OR: Hart, 2010), 205-229.

This vulnerability is well recognised and discussed, but according to experts, protection mechanisms are insufficient.

Finally, like the North Sea, the Baltic Sea was an area of intensive minelaying operations during the two World Wars. After 1945, more than 1 million tonnes of additional ordnance, including ammunition, grenades, mines, and torpedoes, and about 200 000 tonnes of chemical weapons were disposed in the Baltic, including in the Gulfs of Bothnia and Finland. Clearance operations on the main transit routes, estuaries and harbours have taken place ever since. Nonetheless, a substantial amount of ordnance with an uncertain status remains on the seabed. It may never be clear, for example, whether a sudden underwater explosion is due to an old mine or to a sophisticated seaborne improvised explosive device.

## 2. CAPABILITY REQUIREMENTS FOR COASTAL NAVIES

The smaller Western navies of the Baltic Sea – the navies of Estonia, Finland, Latvia, Lithuania and Sweden – are essentially coastal navies (see Annex A). The navies of those states with ambitions and/or obligations to participate significantly in ‘blue water’ operations beyond the Baltic – Denmark, Germany and Poland – must also carry out coastal navy functions closer to home. Coastal navies require

warfare disciplines can be executed in the Baltic Sea, but the level of risk and the probability of success will vary depending on the situation to be dealt with and the platforms available. In this section of our report, we outline the capabilities required by a coastal navy and describe the constraints imposed by the particular operating environment of the Baltic Sea.

### 2.1 GENERAL CAPABILITY REQUIREMENTS

Enclosed seas almost entirely surrounded by a landmass are the most complex environments for the employment of military force.<sup>23</sup> The narrow and winding nature of the Baltic Sea means that almost its entire area is littoral, requiring a particular set of military capabilities and skills. Safe navigation in confined and shallow waters,

*Decision cycles are short, requiring fast and decisive reactions to challenges and threats and the ability to respond—at least initially—with local means and capabilities*

*Enclosed seas almost entirely surrounded by a landmass are the most complex environments for the employment of military force*

offensive capabilities to control national waters and approaches to harbours and critical infrastructure or to regain national territory, and defensive capabilities to deny the naval activities of would be state-on-state aggressors. Assets at sea also contribute to Maritime Situational Awareness (MSA).

All these capabilities must be tailored to operate effectively in the special conditions of the littoral environment. In principle, all maritime

for example, requires specific knowledge and a corresponding need for specialised training. More broadly, the very particular littoral nature of the Baltic Sea requires the development and maintenance of specialised expertise not only for the execution of naval operations, but also for naval planning and naval procurement. Furthermore, the hydrology, meteorology and shallowness of the Baltic Sea introduce both limitations and opportunities for maritime operations. The smart defence project, FIT for CSW, coordinated by NATO’s Centre of Excellence for Operations in Combined and Shallow Waters, provides a framework to assist states in acquiring the necessary capabilities with a particular focus on the challenges of this environment.<sup>24</sup>

Littoral warfare is a special domain in naval warfare that takes the unique conditions of operations in confined and shallow waters

<sup>23</sup> Milan Vego, “On Littoral Warfare,” *Naval War College Review* 68:2 (2015), Article 4: 4.

<sup>24</sup> Centre of Excellence for Operations in Combined and Shallow Waters, “Smart Defence Project FIT FOR CSW,” Centre of Excellence for Operations in Combined and Shallow Waters, <https://www.coecsw.org/our-work/projects/smart-defence-project-fit-for-csw/>.

such as the Baltic into account. An overarching constraint is that the Baltic Sea is confined and situations may thus evolve rapidly. Decision cycles are short, requiring fast and decisive reactions to challenges and threats and the ability to respond – at least initially – with local means and capabilities (as Article 3 of the North Atlantic Treaty expects).<sup>25</sup>

In addition to dealing with the threat created by an adversary's naval assets, littoral warfare must also deal with the permanent military threat from the land, for example, from missiles, electronic warfare (EW), cyber, special forces, and remotely controlled assets. Moreover, it must deal with the threat from the air, again from missiles, drones, cyber and electronic warfare, but also from assets such as bombs and air-delivered naval mines. Littoral warfare, like its blue water equivalent, thus requires: a multi-dimensional picture of the tactical situation, short decision cycles, agility and flexibility; sufficient capabilities for self-protection (e.g. anti-ship missile defence, electronic counter measures, and air-defence systems); and decisive weapons to defend and attack. This can best be achieved through a network-centric approach with a suitable command and information system that ties together all relevant actors in the specific theatre.

Large ships are less well suited to exploit the specific conditions of the littoral environment. Due to their size and draught they lack the agility to hide in shallow waters and archipelagos, and are easier to detect and track. Nonetheless, the combat power of larger ships, their ability to carry and operate organic air assets (usually helicopters, but also including fixed wing aircraft), their role in extended air defence, their long-range missile systems, and their seaborne command and control capability can send a clear signal to a potential opponent if deployed to an enclosed sea. Similar messages can also be sent through the deployment of amphibious forces and reinforcement shipping. Such deployments

need to be well protected or able to repel any attacks (providing superiority and survivability) and must be deeply embedded into the littoral warfare domain; the employment of such assets cannot be achieved on an ad hoc basis, but needs to be thoroughly prepared and exercised.

*A littoral force of 'small and many' rather than 'big and few' offers greater flexibility in crisis and conflict*

As warships of this kind are primarily designed for blue water operations, and will likely face competing demands for their employment in times of crisis, their deployment to the littoral seas should be regarded as a possibility, rather than as a certainty to be relied upon. In general, a littoral force of 'small and many' rather than 'big and few' offers greater flexibility in crisis and conflict.<sup>26</sup>

Some more general points are worth raising. First, as naval vessels are few in number in the inventories of any state and have long lifecycles, future proofing should be a key consideration in their acquisition: they should be built with the expectation that they will have to fulfil roles other than those they were originally designed for, requiring new equipment fits and the upgrade of original systems. Designs should allow for flexibility, scalability, and growth potential.

*All platforms, whether manned or unmanned and above, on or below the water, should be capable of contributing to the strategic, operational and tactical surveillance pictures*

Second, the limited availability of platforms and the growing potential of robotic approaches drives a requirement for navies to explore the value of unmanned or autonomous systems to achieve some naval tasks, for example surveillance and counter-mine operations. These systems may be shore-based, or launched and retrieved from sea-going platforms.

<sup>25</sup> "In order more effectively to achieve the objectives of this Treaty, the Parties, separately and jointly, by means of continuous and effective self-help and mutual aid, will maintain and develop their individual and collective capacity to resist armed attack." "The North Atlantic Treaty," 4 April 1949, [https://www.nato.int/cps/ua/natohq/official\\_texts\\_17120.htm](https://www.nato.int/cps/ua/natohq/official_texts_17120.htm), Article 3.

<sup>26</sup> Wayne P. Hughes, Jr. "Build a Green-Water Fleet," *Proceedings, US Naval Institute*, June 2018, <https://www.usni.org/magazines/proceedings/2018/june/build-green-water-fleet>.

Third, given the importance of MSA, all platforms, whether manned or unmanned and above, on or below the water, should be capable of contributing to the strategic, operational and tactical surveillance pictures. Rapid developments in the field of artificial intelligence suggests that navies should also consider the exploitation of data mining techniques to derive maximum useful information from limited raw data. In both robotics and artificial intelligence, civilian technologies can be exploited for military applications.

Fourth, in crisis situations, EW can be expected to play a major role: Russia's EW capability has evolved through its conflicts in Chechnya, Georgia, Ukraine and Syria to be an important force multiplier that can be expected to feature substantially in any Anti-Access/Area Denial (A2/AD) approach.<sup>27</sup> Future systems will need to be resilient in an EW environment and consideration will need to be given to including counter-EW systems on naval platforms.

Fifth, naval systems must also be resilient in the face of cyber operations. Navies rely heavily on command, control, communications, computer, intelligence, surveillance and reconnaissance (C4ISR) systems and almost all systems integrated into modern warships, whether sensors, weapons, navigation, environment or control systems, are networked and often connected to the internet. These systems are vulnerable to cyber-attack. At the very least, naval vessels must be capable of defensive cyber operations to protect their own systems from a range of cyber-attacks. But states should also consider the roles that offensive cyber capability may play, alongside traditional kinetic capability, in achieving operational effects.<sup>28</sup>

## 2.2 OFFENSIVE CAPABILITY REQUIREMENTS

Offensive capabilities include amphibious warfare to move military and security forces via the sea, and mine-laying to restrict the access of hostile forces. Significant, large-scale

amphibious capability is largely beyond the means of the Baltic navies, but small-scale amphibious operations may be conducted using a combination of government (e.g. naval, constabulary) and civilian vessels to regain territory in the event of crisis or war.

The Baltic's many shallow areas make it very suitable for effective mine-warfare activities. Minefields may be used to effectively change local geography to the disadvantage of an adversary by channelling or hampering the flow of opposing forces, or even by blocking them

*The Baltic's many shallow areas make it very suitable for effective mine-warfare activities*

entirely. They can be easily established in the Baltic as anti-invasion or protective measures within a state's own territorial waters, and thus be used to deny access to vital areas and to protect key infrastructure such as ports. Minelaying capability can be achieved at relatively low cost: operations can be executed by specialised units carrying and deploying mines hidden beneath their main deck, or by less specialised vessels equipped with mine rails. It is not necessarily the quantity of mines that can be laid, but the existence of the capability itself that will slow an adversary's operational tempo and be a disruptive factor in his operational planning.

## 2.3 DEFENSIVE CAPABILITY REQUIREMENTS

Defensive capabilities prevent adversary naval forces approaching the coastline on the surface (Anti-Surface Warfare (ASuW) and anti-amphibious capabilities), below the surface (Anti-Submarine Warfare (ASW) and mine-clearance capabilities), or in the air (Anti-Air Warfare (AAW) capabilities). Possession of these capabilities also acts as a deterrent to prevent hostile activities in the first place.

### 2.3.1 ANTI-SURFACE WARFARE

To successfully deal with state-on-state threats, coastal navies need capabilities to deny access to their littoral by larger power projection navies, both on and below the surface. ASuW entails the use of kinetic or explosive munitions to neutralise or sink an adversary's surface vessels. These may be delivered: from the land (a coastal

<sup>27</sup> Roger McDermott, *Russia's Electronic Warfare Capabilities to 2025. Challenging NATO in the Electromagnetic Spectrum* (Tallinn: ICDS, 2017), 28-30.

<sup>28</sup> Ralph Thiele, "Game Changer – Cyber Security in the Naval Domain," Center for Security Studies, 17 January 2018, <https://isnblog.ethz.ch/maritime-security/game-changer-cyber-security-in-the-naval-domain>.



defence system employing shore-based anti-ship missiles); from the sea (naval ships such as corvettes and frigates equipped with large-bore guns, missiles or mines, or smaller fast patrol boats equipped with missiles or mines); or from the air by appropriately configured aircraft carrying bombs and/or missiles. Anti-ship missiles can also employ third party targeting through remote sensors for operations beyond the range of organic sensors.

*The littoral environment of the Baltic is well-suited to ASuW since, in addition to ship-based munitions, much of the sea is also within the range of land-based systems*

The littoral environment of the Baltic is well-suited to ASuW since, in addition to ship-based munitions, much of the sea is also within the range of land-based systems. Also, the short distances in the more confined parts of the sea make surprise attacks from sheltered or hidden positions feasible; in particular with the improved range, speed, flight profiles and target acquisition and tracking capability made possible by advanced missile technologies.

The complex geography of the Baltic Sea and frequent weather phenomena such as heavy fog or rain may, however, reduce the range and discrimination of above-water maritime radar, optical and infra-red sensors, and be detrimental to the performance of effectors such as missiles.

### 2.3.2 ANTI-SUBMARINE WARFARE

Denying hostile submarines requires additional capabilities: radar and sonar sensors to contribute to MSA and provide precise locating data, and different munitions to harass or destroy targets. When operating in their coastal roles, submarines are most effective at periscope depth, where they can be located visually or with special surface search radars that can detect the periscope and other communication masts. The necessary visual aids and radar can be operated from ships, aircraft, or from the land. These methods are hampered by weather conditions that reduce visibility and increase sea state; such conditions also degrade the capabilities of submarines themselves. Submerged submarine

(below periscope depth) detection requires passive and/or active sonar systems.

In general, the best anti-submarine warfare platform is another submarine. The shallow waters of the Baltic Sea, however, have an impact on their employment. Underwater warfare with submarines is possible, but requires specially designed, small submarines which can transit submerged through shallow

waters and hide their presence to the maximum extent. The submarines of the German and Swedish fleets belong in this category, while Russia's *Kilo* and *Lada* class submarines are at the upper limit and are not optimised for this type of operation. Operations involving larger, ocean-going

submarines are possible only in the deeper waters east of Bornholm and off Gotland; and to reach these locations, submarines must take extra precautions to avoid detection as they transit through shallow waters.

After submarines, maritime patrol aircraft (MPA) and helicopters, equipped with sonar, periscope detection radars, and anti-submarine torpedoes, are the next best choice for ASW operations, followed by surface ships. Undersea operations in the Baltic are further complicated by its layered salinity, which can degrade underwater sensors and underwater weapons. The specialised underwater sensors needed to counter this difficult hydrology, such as variable depth or dipping sonars, are best employed by ASW helicopters in cooperation with MPA. Temporary sonobuoy fields can also be dispersed by fixed wing MPA or helicopters. UUVs and fixed sonar arrays can also be used to detect submarines.

*The sensors that are typically installed on larger warships for blue water operations may be far from optimal for operations in the Baltic Sea*

Larger naval combatants are often equipped with their own hull mounted sonar systems (active and passive), variable depth towed sonar systems (passive) and ASW helicopters. But sensors must be optimised for their operating environments; the sensors that are typically installed on larger warships for blue



water operations may be far from optimal for operations in the Baltic Sea.

Once located, submarines are attacked with torpedoes launched from submarines, ships, and helicopters, or possibly from land using an anti-submarine rocket that deploys a torpedo. Surface ships may also employ depth charges or torpedoes to harass or sink a submarine. For a small state, perhaps the most cost effective way to counter the submarine threat is to employ periscope detecting radar and towed variable depth or UUV sonar capabilities from a multi-role ship. This ship could also be armed with depth charges or anti-submarine torpedoes. In addition, fixed sensors in critical approaches could assist with MSA, but may be expensive to man and maintain in relation to the peacetime threat.

### 2.3.3 MINE COUNTERMEASURES

The other submerged threat is naval mines, which may be located and destroyed by mine-sweeping and mine-hunting vessels. Mine sweepers detonate contact mines by towing a sweep, while mine hunting involves the use of mine locating and bottom scanning sonar systems to identify the location of influence or contact mines. These sonar systems can be mounted on the hulls of naval vessels or deployed using remotely operated UUVs. Mines are neutralized by disarming or destroying them with explosive ordnance disposal divers or specifically designed remotely operated vehicles.

Mine Countermeasure (MCM) operations are time-consuming and tedious. The variety of mines, ranging from dumb contact mines to sophisticated and buried mines, requires a huge knowledge base, experience and suitable platforms to execute successful MCM operations. In peacetime, MCM forces play an important role in route surveillance (to declare areas and routes free of naval mines) and in the disposal of seaborne ordnance.

### 2.3.4 ANTI-AIR WARFARE

AAW includes operations ranging from self defence against attacks by fighter-bomber aircraft and missiles, through extended air defence for an entire naval task force, up to

ballistic missile defence protecting entire regions. A full AAW suite is probably beyond the means of a coastal navy. But self-defence and anti-ship missile defence are relevant for the Baltic Sea, where very short reaction times make capabilities for sufficient self defence against air and missile attacks – and thus survivability – paramount. Both can be achieved by a ‘soft kill’ using electronic warfare means such as chaff, jamming and infra-red flares, or by a hard-kill using close-in weapon system guns or an air defence missile. Combining systems into a layered defence cordon offers the greatest chance of success. Maritime air defence systems can also be used to complement ground- and air-based air defence systems to protect assets located on the land.

## 2.4 MARITIME SITUATIONAL AWARENESS, C4ISR AND JOINT COMMAND AND CONTROL

Prerequisites for employing either offensive or defensive capabilities effectively include: MSA to detect and monitor threats across the spectrum; C4ISR capabilities to evaluate threats; and effective joint command and control (C2) to direct or coordinate action to mitigate or eliminate them.

*Maritime security and naval operations require a clear picture of all the actors operating on the sea and what they are doing*

Maritime security and naval operations require a clear picture of all the actors operating on the sea and what they are doing in order to detect and respond to threats to the state, lines of communication, critical infrastructure and harbour facilities amid the many merchant, fishing, leisure and military vessels that may be at sea at any given time. MSA is the effective understanding of activities, associated with and occurring in the maritime domain that could impact security, safety and the environment.<sup>29</sup> Some agencies, notably the US Navy, use the term maritime domain awareness, but MSA is generally understood to also take account of the situation on the nearby land; it is thus the more

<sup>29</sup> European Union, European Defence Agency, “Maritime Surveillance (MARSUR),” European Defence Agency, 1 June 2017, [https://www.eda.europa.eu/what-we-do/activities/activities-search/maritime-surveillance-\(marsur\)](https://www.eda.europa.eu/what-we-do/activities/activities-search/maritime-surveillance-(marsur)).

appropriate term to use when describing the littoral environment.<sup>30</sup>

Basic MSA is provided by sea surveillance radars and data provided by large ships via the International Maritime Organisation's mandatory (for civilian ships greater than 300 tonnes) Automatic Identification System

*A more thorough level of MSA requires presence at sea for the visual and electromagnetic spectrum identification of vessels and operating patterns*

transponders. A more thorough level of MSA requires the sharing of contact data between national maritime agencies and other states, military hardened surveillance capability and, most importantly, presence at sea for the visual and electromagnetic spectrum identification of vessels and operating patterns. Maritime surveillance systems should be linked or processes automated to share the necessary information as quickly as possible, while military sea surveillance radars should be survivable in a kinetic and electronic warfare environment, requiring either hardened or mobile radar systems.

The practical implementation of MSA usually entails the establishment and maintenance, by a central agency using a variety of sources, of a comprehensive and up-to-date Recognised Maritime Picture (RMP), which can then be distributed to users. A detailed, real-time RMP is the first step required to rapidly respond to any threat at sea. National and regional operations centres should thus have frameworks to share and coordinate important maritime contacts and vessels of concern to build a complete picture of the activity on and under the areas of the sea of interest. In a perfect operational scenario, they would also share details of exercises and operations so that the best international response to specific threats could be formulated. Developing a complete RMP will require the sharing of nationally classified, and perhaps sensitive,

information, placing additional requirements on governance structures.

C4ISR systems should support the capability to share important threat and situation information (e.g. visual, radar, signals intelligence) between national and international agencies to support the detect-analyse-act process in the maritime domain. They should also provide the command and control necessary to direct action.

Naval warfare is best planned, commanded, and controlled in a joint manner alongside land and air warfare as armed forces operating in the littoral

are vulnerable to hostile air activity and military actions from the land. Joint C2 ensures the synergistic application of force from all services, regardless of whether the operation is defensive or offensive. A joint commander operating in a joint command centre, coordinates the military activities of the land, air and sea component commanders on the best use of the assets available for the best effect across the entire battle space. The commander also works closely with the national government, its agencies, non-governmental organisations and institutions to best leverage all instruments of national power.

### 3. RUSSIAN CHALLENGES TO THE BALTIC NAVIES

The only plausible military challenges to the navies of the states surrounding the Baltic Sea come from Russia. Such challenges may appear on a spectrum from peace through to high-end war in the region. In this section of our report, we discuss the Russian challenge in the maritime domain and include some briefly sketched situations to illustrate these challenges.

*Russia is already actively challenging the West in peacetime, using naval assets in the Baltic Sea to support its broader political strategy of re-asserting regional influence*

<sup>30</sup> Lutz Feldt, "The Complex Nature of Today's Maritime Security Environment. A European Perspective," in *Routledge Handbook of Naval Security and Strategy*, ed Joachim Krause, and Sebastian Bruns (Abingdon and New York: Routledge, 2016), chap 2, e-book.

#### 3.1 PEACETIME

Russia is already actively challenging the West in peacetime, using naval assets in the Baltic

Sea to support its broader political strategy of re-asserting regional influence. Its naval presence in the Baltic Sea is frequent and deliberately visible. The ships of its Baltic Fleet, transiting between Baltiysk (near Kaliningrad) and Kronstadt (near Saint Petersburg), are frequently sighted in very close proximity to the territorial waters of the Baltic states. Most of what Russia does is quite routine and in accordance with international maritime law (and is often mirrored by similar NATO activities such as exercises or intelligence gathering).<sup>31</sup> However, Russian activities are sometimes confrontational, even provocative, and often timed to reinforce political messaging, serving to highlight Russia's claim to naval preponderance in the Baltic Sea and to emphasise the security, military and economic vulnerabilities of states such as Estonia, Latvia and Lithuania. Disruptive Russian naval activities are thus bound to be seen as threatening to regional security.

*The Baltic Fleet has been active in showing presence, demonstrating readiness through live fire exercises, and displaying Russia's negative attitude towards NATO, and especially US naval presence*

In addition to routine transits, the Baltic Fleet has been active in showing presence, demonstrating readiness through live fire exercises, and displaying Russia's negative attitude towards NATO, and especially US naval presence (in particular when related to ballistic missile defence, e.g., Aegis ships). Recent examples of hostile activity include: the harassment of a US cargo ship on its approach to Klaipeda carrying equipment for exercise *Sabre Strike 2017*; the 2018 testing of missiles in Latvia's EEZ, forcing airspace closures and the re-routing of seaborne traffic; and in 2019 the trailing by Baltic Fleet corvettes of US destroyers in the Baltic Sea and the simulation of missile

attacks on sea targets from Kaliningrad.<sup>32</sup> However, Russia's ability to flex its muscles in this way – and to conduct large, boastful naval parades – is not necessarily an indication of a capability for sustained combat operations; there are signs that such displays mask persistent structural weaknesses in equipping, training and operating the Russian Navy.<sup>33</sup>

*There are signs that such displays mask persistent structural weaknesses in equipping, training and operating the Russian Navy*

The Baltic Fleet has also been used to obstruct the activities of other regional states. Throughout 2015, Russia repeatedly declared an exercise zone in Lithuania's EEZ and ordered a ship laying the NordBalt power cable to leave the area, delaying the project. This elicited diplomatic protests from Vilnius and Stockholm, eventually prompting Lithuania to dispatch a naval patrol ship to assert its economic rights. Russia also caused serious and quite unprecedented disruption to regional air traffic by declaring missile exercises in international waters just off the coast of Latvia, following the Baltic-US summit in Washington in 2018.<sup>34</sup> In both instances, Russia employed naval power both to display its political stance in relation to activities and events of strategic importance to the Baltic states (increasing energy security, strengthening relations with a key Ally) and to demonstrate its ability to shape the Baltic Sea security environment in ways it pleases.

<sup>31</sup> Sean Fahey, "Russian Warships in Latvian Exclusive Economic Zone: Confrontational, Not Unlawful," Centre for International Maritime Security, 15 May 2017, <http://cimsec.org/russian-warships-latvias-exclusive-economic-zone-confrontational-not-unlawful/32588>.

<sup>32</sup> David B. Larter, "Russian military 'harassed' US-flagged merchant ship in the Baltic ahead of exercises," *Defense News*, 27 June 2017, <https://www.defensenews.com/naval/2017/06/27/russian-military-harassed-us-flagged-merchant-ship-in-the-baltic-ahead-of-exercises/>; Daniel Cebul, "Russia tests missiles in Baltic Sea, forcing partial closing of sea and airspace," *Defense News*, 4 April 2018, <https://www.defensenews.com/global/2018/04/04/russia-tests-missiles-in-baltic-sea-forcing-partial-closing-of-sea-and-airspace/>; Patrick Tucker, "US and Russia Regard Each Other Warily in the Baltic and Black Seas," *Defense One*, 24 January 2019, <https://www.defenseone.com/threats/2019/01/us-and-russia-eye-each-other-warily-baltic-and-black-seas/154404/>.

<sup>33</sup> Brad Lendon, "Russia's navy parade: Big show but how much substance?" *CNN*, 29 July 2018, <https://edition.cnn.com/2018/07/29/europe/russia-navy-parade-intl/index.html>.

<sup>34</sup> Michael Birnbaum, "Russia tests missiles in the Baltic Sea, a day after Baltic leaders met with Trump," *Washington Post*, 4 April 2018, [https://www.washingtonpost.com/world/europe/russia-tests-missiles-in-the-baltic-sea-a-day-after-baltic-leaders-met-with-trump/2018/04/04/0a35e222-380d-11e8-af3c-2123715f78df\\_story.html](https://www.washingtonpost.com/world/europe/russia-tests-missiles-in-the-baltic-sea-a-day-after-baltic-leaders-met-with-trump/2018/04/04/0a35e222-380d-11e8-af3c-2123715f78df_story.html).

One way to frame the role of Russia's naval capabilities is 'armed suasion' – a term coined by Edward Luttwak that covers both the

and this is perhaps the most likely form in which it would challenge the Baltic Sea states in the maritime domain.

*Russia's fleet is as much an instrument for sending political signals to opponents and allies as it is a warfighting tool to support military strategy and operations*

compellence and deterrence aspects of strategy in peacetime, crisis and war, and that "usefully suggests the indirectness of any political application of naval force."<sup>35</sup> Russia's fleet is as much an instrument for sending political signals to opponents and allies as it is a warfighting tool to support military strategy and operations. This dual role is manifest in Russia's bastion defence concept, whereby key points of strategic importance to Russia – the Kola Peninsula in the High North, the Kaliningrad exclave, and the annexed Crimea in the Black Sea – are used to project power and are protected with a variety of defensive and offensive systems with ranges of hundreds of kilometres.<sup>36</sup> These systems not only create several layers of protection, but also enable deterrence through armed suasion, signalling to NATO that attempts to encroach upon Russia by attacking these bastions would entail very high costs.

### 3.2 HYBRID WARFARE

The Baltic Sea environment is well-suited to hybrid approaches and can be effectively exploited for the purposes of economic sabotage, information and psychological warfare as well as political destabilisation, while confusing the target audiences about the actual source or nature of the threat.<sup>37</sup> Russia has demonstrated this approach in action (in this case, in the land domain) in its war in Ukraine

Of course, none of Russia's official policy documents refer to 'hybrid threat' as a way of dealing with geopolitical opponents. Russia's naval policy does identify possibilities for "destroying the military-economic potential of opponents by destroying their vital objects from the sea," but falls short of prescribing any action, let alone actions in the form of 'hybrid threats' from or at sea.<sup>38</sup> However, many Western observers have noted, for instance, the Russian Navy's growing interest in critical undersea infrastructure, particularly that connecting Europe and North America.<sup>39</sup>

*The range of possible hybrid operations in the Baltic Sea is large and – by the very nature of hybrid warfare – unpredictable*

The range of possible hybrid operations in the Baltic Sea is large and – by the very nature of hybrid warfare – unpredictable, but examples might include:

- covert, but deniable activities that test resilience and spread unease, such as the still unconfirmed hostile submarine operation in the Swedish archipelago in 2014;
- actions directed against critical infrastructure using platforms designed for 'research' or platforms for covert special operations that are difficult to detect and intercept;
- the blocking of a bottleneck by a maritime 'accident';
- the seizure of coast guard vessels alleged to have entered the territorial waters of a hostile state;
- the covert use of civilian vessels such as commercial or cruise ships to transport military personnel and materiel, or to gather intelligence. Estonia's foreign intelligence

<sup>35</sup> Edward N. Luttwak, *The Political Uses of Sea Power* (Baltimore: The Johns Hopkins University Press, 1974), 3.

<sup>36</sup> Although its origins go back to the Cold War era, its contemporary precursor was articulated in 2001, in V.A. Veselov and A.V. Liss, *Sderzhivaniye vo Vtorom Yadernom Veke* (Deterrence in the Second Nuclear Age) (Moscow: Russian Academy of Sciences, Institute of International Security Problems, 2001).

<sup>37</sup> For a discussion of possible hybrid opportunities in the Baltic Sea, see Martin Murphy and Gary Schaub Jr., "'Sea of Peace' or Sea of War – Russian Maritime Hybrid Warfare in the Baltic Sea," *Naval War College Review* 71:2 (2018) Article 9, 9-12.

<sup>38</sup> Prezident Rossii (President of Russia), "Ukaz Prezidenta Rossiyskoy Federatsii ot 20.07.2017 g. Nr 327" (Decree of the President of the Russian Federation of 20/07/2017 No. 327), <http://kremlin.ru/acts/bank/42117>, paragraph 33.

<sup>39</sup> Magnus Nordenman, "Russian Subs Are Sniffing Around Transatlantic Cables. Here's What to Do About It," *Defense One*, 17 January 2018, <https://www.defenseone.com/ideas/2018/01/russian-subs-are-sniffing-around-transatlantic-cables-heres-what-to-do-about-it/145241/>.

service has highlighted this as a particular concern in its latest report; and

- the use of simulated mine explosions, amplified with disinformation campaigns, to cast doubt on the safety of Baltic transit routes or harbour entrances.<sup>40</sup>

It is further possible, because of the littoral environment, that hybrid threats to the maritime domain could be based on the land. For example, the September 2018 raids by Finnish police supported by other forces on several locations in the archipelago, officially explained as crackdowns on financial crimes, led many to speculate that the islands were being prepared as possible launch points for some sort of hybrid action.<sup>41</sup>

*Hybrid situations create uncertainty and confusion, making it difficult to establish the nature and urgency of the threat they pose*

Hybrid situations share at least two features in common. First, they create uncertainty and confusion, making it difficult to establish the nature and urgency of the threat they pose. In particular, hybrid actions can be expected to fall below thresholds that would trigger a more robust (typically a military) response; threats may thus escalate gradually and undetected until a critical situation has been reached. Second, it is not immediately obvious which agency – maritime, constabulary or naval – should take the lead in responding or, indeed, what response is demanded.

### 3.3 HIGH-END WARFARE

While high-end warfare in the Baltic region remains unlikely, perhaps the most plausible warfighting scenario is one in which Russia rapidly seizes the territory of one or more of the three Baltic states. This might take

the form of a small-scale action, such as the seizing of an island with a view to gaining a military advantage in the Baltic Sea at a time of heightened tensions, or a full-scale invasion. Any such action would require a response from NATO under Article 5 of the North Atlantic Treaty. NATO has, since 2014, taken this prospect more seriously and put in place measures to deter Russia. The most visible manifestation of this agenda has been the deployment to Poland and the three Baltic states of multinational, battalion-size battlegroups under the enhanced Forward Presence (eFP) initiative.<sup>42</sup> The eFP battlegroups are a welcome contribution to both deterrence and the prospective defence of their host states, but they are sized as a tripwire, rather than a force able to mount a credible, large-scale defence.<sup>43</sup>

In the event of a major crisis NATO would need to reinforce the region on a large scale and the establishment of sea control to preserve SLOCs in

the Baltic Sea would be paramount. In another indication of NATO's renewed seriousness about collective defence, it practised for a situation comparable to this in and around Norway during its large-scale exercise, *Trident Juncture 2018* (in conjunction with exercise *Northern Coasts*

*In the event of a major crisis NATO would need to reinforce the region on a large scale and the establishment of sea control to preserve SLOCs in the Baltic Sea would be paramount*

2018 in the Baltic Sea). In *Trident Juncture*, NATO rehearsed the restoration of the sovereignty of an Ally following an armed aggression, including through the deployment of NATO's rapid reaction forces – the Very High Readiness Joint Task Force (VJTF) and the NATO Response Force 2019.

<sup>40</sup> Peter Walker, "Sweden searches for suspected Russian submarine off Stockholm," *The Guardian*, 19 October 2014, <https://www.theguardian.com/world/2014/oct/19/sweden-search-russian-submarine-stockholm>; Välisluureamet, *International Security and Estonia 2019*, 12-14.

<sup>41</sup> Andrew Higgins, "On a Tiny Finnish Island, a Helipad, 9 Piers – and the Russian Military?" *The New York Times*, 31 October 2018, <https://www.nytimes.com/2018/10/31/world/europe/sakkiluoto-finland-russian-military.html>.

<sup>42</sup> NATO, "Boosting NATO's presence in the east and southeast," NATO, 21 January 2019, [https://www.nato.int/cps/en/natohq/topics\\_136388.htm](https://www.nato.int/cps/en/natohq/topics_136388.htm).

<sup>43</sup> Kalev Stoicescu and Pauli Järvenpää, *Contemporary Deterrence – Insights and Lessons from Enhanced Forward Presence* (Tallinn: ICDS, 2019), 6.



In these scenarios, the ability of the Russian systems deployed for extended bastion defence – short, medium and long range precision-guided cruise and ballistic missiles, anti-ship missiles, air defence and electronic warfare systems in the Kaliningrad exclave, Belarus and parts of the Western Military District – may also complicate NATO's access to and movement within the Baltic region. In Western thinking, this correlates with the A2/AD concept, often perceived as a major challenge to the Alliance's military planning and posture in defending vulnerable frontline Allies or in deterring Russia's aggression against them.<sup>44</sup>

*The ability of the Russian systems deployed for extended bastion defence may also complicate NATO's access to and movement within the Baltic region*

In the type of fait accompli scenario that Russia might be tempted to prosecute in the Baltic states, A2/AD supported by strategic signalling towards NATO Allies could serve as a potent tool of armed suasion.<sup>45</sup> According to a 2019 study, however, the effectiveness of Russia's A2/AD capabilities has been overestimated – while they present a problem, it is a problem that NATO can handle.<sup>46</sup> This perspective also partly reflects the views of the US Chief of Naval Operations, Admiral John Richardson, who has argued that the US Navy should stop using the term 'A2/AD'.<sup>47</sup>

<sup>44</sup> Sam Tangredi, *Anti-Access Warfare. Countering A2/AD Strategies* (Annapolis: Naval Institute Press, 2013), 32–33; Guillaume Lasconjarias, and Tomáš A. Nagy, "NATO Adaptation and A2/AD: Beyond the Military Implications", GLOBSEC, 21 December 2017, <https://www.globsec.org/publications/nato-adaptation-A2/AD-beyond-military-implications/>.

<sup>45</sup> The dynamics and outcome of a scenario in which Russia rapidly seizes the Baltic states in a surprise attack and is then able to negotiate from a position of strength became most widely known as a result of a series of wargames conducted by RAND Corporation analysts: David A. Shlapak and Michael W. Johnson, *Reinforcing Deterrence on NATO's Eastern Flank: Wargaming the Defense of the Baltics* (Santa Monica, CA: RAND Corporation, 2016).

<sup>46</sup> Robert Dalsjö, Christofer Berglund and Michael Jonsson, *Bursting the Bubble. Russian A2/AD in the Baltic Sea Region: Capabilities, Countermeasures, and Implications* (Stockholm: Fol, 2019), 78.

<sup>47</sup> John Richardson, "Deconstructing A2AD," *The National Interest*, 3 October 2016, <https://nationalinterest.org/feature/chief-naval-operations-adm-john-richardson-deconstructing-17918>.

In a conflict with NATO, the principal focus of Russia's maritime operations would most likely be in the North Atlantic and Arctic Oceans,

*In a conflict with NATO, the principal focus of Russia's maritime operations would most likely be in the North Atlantic and Arctic Oceans*

rather than the Baltic. Maintaining control of the Baltic Sea maritime domain in crisis and war would be a part of the broader strategic picture of NATO's defence efforts, closely linked with preserving the Alliance's ability to move forces across the North Atlantic, and keeping Russian naval forces behind the bottleneck of the GIUK gap. The maritime domain is also interlinked with the air, land, cyber, information and space domains as part of a multi-dimensional theatre of operations. In short, while the Baltic maritime domain is the focus of this report, it cannot be viewed in isolation, either from broader geographical considerations, or from other operational domains. Indeed, in the event of a large-scale conflict between NATO and Russia, even one that started in the Baltic region, the Baltic Sea would be just one theatre, along with the North Atlantic, North Sea, and Barents Sea.<sup>48</sup>

It is also likely that in the event of Russian attempts to prevent the Allies deploying to, or operating in the Baltic region, Allied operations to restore a more permissive operating environment would initially be focused on air, and perhaps submarine and mining operations, rather than the full spectrum of naval capabilities.<sup>49</sup> The strategic importance of the Baltic Sea in a general war between NATO and Russia should thus be kept in perspective.

<sup>48</sup> Rowan Allport, *Fire and Ice – A New Maritime Strategy for NATO's Northern Flank* (London: Human Security Centre, December 2018), 69.

<sup>49</sup> Stephan Frühling and Guillaume Lasconjarias, "NATO, A2/AD and the Kaliningrad Challenge", *Survival* 58:2 (2017): 107.



## 4. DEFENCE AND DETERRENCE IN THE BALTIC REGION: THE MARITIME CONTRIBUTION

In this part of our report, we describe our key findings and make recommendations. The material that follows is based upon a consideration of the possible challenges to the Baltic navies described in section 3, set against the context of the capability requirements for coastal navies outlined in section 2, and informed by our discussions with our interlocutors.

### 4.1 RUSSIA

**NATO** (and its Allies and partners) should:

- continue to monitor Russian naval developments;
- place greater emphasis on the threats posed by hybrid maritime operations and explore possible means to counter them; and
- place greater emphasis in their strategic messaging on Russia's substantial economic dependence on the Baltic Sea, and its vulnerability to the disruption of trade flows in the region.

Russia's Baltic Fleet is – at present – the largest national navy operating in the Baltic Sea. More than any other navy of the region, Russia strives to be constantly present in the Baltic in peacetime, adopting a posture that is assertive, and frequently provocative. Through such actions, Russia signals that the Baltic Sea, and in particular the waters adjacent to the Kaliningrad exclave and the SLOCs to Kaliningrad, are essential for its defence, and that NATO – in particular, the US – has no business in at least the eastern Baltic. As NATO's defence of the Baltic states would depend heavily on access to the Baltic Sea for large-scale reinforcement, this is clearly a signal that the Alliance cannot accept.

The Baltic Sea also offers Russia numerous opportunities for hybrid mischief; this is the most likely form of a Russian maritime domain

challenge to any of the other states that surround the Baltic Sea. The very nature of hybrid actions means that their details cannot be predicted in advance. It is, instead, essential to build awareness, in order that any unusual

*The Baltic Sea offers Russia numerous opportunities for hybrid mischief; this is the most likely form of a Russian maritime domain challenge*

patterns that might indicate a hybrid attack can be recognised early and acted upon.

In crisis and wartime, the Baltic Fleet would likely have only a small role to play in contributing submarine- and surface-launched missile capability to any A2/AD efforts – its present limited capabilities for area air defence make it too vulnerable to sustain the required presence. Even then, the number of missiles deployed with the Baltic Fleet is small compared to those long-range systems such as *Kalibr* deployed further afield which could still threaten Baltic targets; the hypersonic cruise missiles currently under development will potentially further reduce reaction times and increase the effectiveness of this stand-off approach.<sup>50</sup> Russia's supersonic coastal anti-ship missile system, *Bastion-P*, now deployed in Kaliningrad, would also present a larger threat than the Baltic Fleet to the freedom of movement of Baltic and Allied navies in a crisis.<sup>51</sup>

In addition, the Baltic fleet might conduct mining operations (which may be covert or overt according to the intended effect) and should be expected to play a role in providing an inner layer of defence for the approaches to St Petersburg and any captured territories – which, depending on the extent of such gains, could stretch it thinly. In wartime situations, the geography of the Baltic Sea would in any case ensure that the ships of the Baltic Fleet would often be vulnerable from both the land and the air, as well as from the sea.

<sup>50</sup> Dalsjö, *Bursting the Bubble*, 59; Ryan Hilger, "Red Sky in Morning: Naval Combat at The Dawn of Hypersonics," War on the Rocks, 28 February 2019, <https://warontherocks.com/2019/02/red-sky-in-morning-naval-combat-at-the-dawn-of-hypersonics/>.

<sup>51</sup> Dalsjö, *Bursting the Bubble*, 32-4.

While NATO and the states surrounding the Baltic Sea should continue to monitor Russian naval developments, the threat posed by the Baltic Fleet should not then be overestimated. While it could be reinforced during times of crisis (unless reinforcements were frustrated by Allied efforts), it is in peacetime the weakest of the Russian fleets. In the Euro-Atlantic theatre, Russia prioritises instead the Northern Fleet which, in an echo of Cold War thinking, has a key role in defending the patrolling areas of Russia's strategic submarines in the Barents and Kara Seas.<sup>52</sup> By comparison, the Baltic Fleet is designed for limited support operations, rather than decisive sea battles. Despite the occasional mysterious provocation in territorial waters, the Russian submarine threat in the Baltic Sea is also low, and ought to be manageable with local (possibly modernised) ASW assets.

Beyond the realm of naval capabilities, the Allies should not overlook the fact that they have some leverage as a result of Russia's economic dependence on the Baltic Sea. The damage that Russia would suffer if Baltic trade volumes – on and below the surface – were threatened may well moderate any temptation it may have to take risks in the Baltic Sea. Still, Russia's resilience to economic coercion (including by means of putting military pressure on its seaborne trade) in a protracted and broader confrontation should not be under-estimated.<sup>53</sup>

*The Baltic Fleet is designed for limited support operations, rather than decisive sea battles*

In the event of a crisis or conflict, the SLOCs to Kaliningrad would be militarily vital to Russia and would represent a major vulnerability – or, an opportunity for NATO. NATO, and the Allies and partners should do more to emphasise these vulnerabilities, as part of a deterrence by punishment approach, in their strategic messaging.

## 4.2 NATO

### NATO should:

- continue to deploy and exercise principal surface combatants on the Baltic Sea;
- enhance its overall naval presence in the Baltic, in particular in the eastern Baltic; and
- ease force generation problems for deterrence operations by reorganising its exercise programme.

### The Baltic Sea states should:

- ease force generation problems for deterrence operations by exploring options to improve maritime military mobility; and
- investigate options to enhance connectivity between their own command, control, communications, computer, intelligence, surveillance and reconnaissance systems networks and visiting warships to provide for better training opportunities in the region.

While Russia's Baltic Fleet may be relatively weak, it must be measured against the capabilities that the Allies and partners are able to field in the region. There has been, since the end of the Cold War, a decline in the naval capability of Western states and a reduced interest in maritime matters. Although during the post-Cold War period Allied navies extended their geographic horizons beyond NATO's area of responsibility through their role in underpinning crisis response operations, the focus on land and air forces in this era led to a side-lining of NATO's maritime role and a growth in the neglect of the maritime domain – or 'sea blindness'.<sup>54</sup> Navies during this period were largely focused on blue water operations; the decline in interest in littoral operations was thus sharper still. Amongst other factors, the wake-up call provided by Russia's aggression against Ukraine has led to something of a reversal in the fortunes of Western navies, part of a global trend that sees greater attention being paid to

<sup>52</sup> Rowan Allport, *Fire and Ice – A New Maritime Strategy for NATO's Northern Flank* (London: Human Security Centre, 2018), 31.

<sup>53</sup> Michael Fitzsimmons, "Horizontal Escalation: An Asymmetric Approach to Russian Aggression?" *Strategic Studies Quarterly*, 13:1 (2019): 112-113.

<sup>54</sup> Diego A. Ruiz Palmer, "A Maritime Renaissance. Naval Power in NATO's Future," in *Routledge Handbook of Naval Security and Strategy*, ed Joachim Krause and Sebastian Bruns (Abingdon and New York: Routledge, 2016), chap 26, e-book.

the maritime domain. As the 2019 edition of the IISS Military Balance notes:

the growing complexity of the maritime domain is leading to a general rise in capability requirements for naval vessels, particularly for principal surface combatants like frigates, but also for smaller surface combatants and patrol vessels ... Navies, particularly long-established forces, are emphasising the need to boost ship numbers, following years of fleet reductions.<sup>55</sup>

Russia's actions in Ukraine also prompted NATO to take more seriously its obligations to those states which joined the Alliance after the end of the Cold War. The most visible manifestation of NATO's reengagement with its core mission of collective defence has been the eFP deployments to Poland and the three Baltic states. But NATO is also paying greater attention to the maritime aspects of collective defence. Higher-end naval warfighting skills are being practised in large maritime exercises such as the US-led *BALTOPS*, which in 2018 brought more than 40 ships and 60 aircraft to the Baltic Sea, and the Finnish-led *Northern Coasts*, which assembled similar numbers in the same year (*Northern Coasts* was initiated by Germany in 2007; the lead/host role is rotated).<sup>56</sup> *Trident Juncture 2018* also involved a substantial naval component including a strike group based around the aircraft carrier USS Harry S. Truman, and incorporated exercises in the north Atlantic as a potential theatre of operations.<sup>57</sup>

This last example is significant in planning and preparing for wartime scenarios, as NATO's exercise of sea control in the North Atlantic is a pre-requisite for its defence of the Baltic region. Transatlantic SLOCs will need to be protected and Russia's Northern Fleet held behind the GIUK gap. There are likely to be few NATO principal surface combatants available to conduct operations in the Baltic Sea. In any case, their vulnerability to Russian A2/AD capabilities would likely outweigh their contribution to changing the course of a conflict in its early

*NATO's exercise of sea control in the North Atlantic is a pre-requisite for its defence of the Baltic region*

stages. As a 2019 report from the Swedish Defence Research Agency argues:

prudence calls for hedging bets on being able to disable remote [A2/AD] sensors or finding and neutralizing all anti-ship missile batteries. Such efforts need to be combined with a robust capability to protect ships or convoys by electronic jamming, decoys and a multi-layered anti-missile defence ... the effect of the land-based anti-ship missile threat may be that reinforcement and resupply by sea – necessary for bringing forward heavy units – to the Baltic states may be delayed or have to be re-routed, and that the existence of a lingering residual threat will increase the risk of such transports.<sup>58</sup>

Nonetheless, NATO's activities in the maritime domain in the Baltic region form part of its overall defence and deterrence posture. A broad NATO peacetime presence – in particular, the additional presence of vessels from Allies who do not border the Baltic Sea – is necessary to signal the Alliance's determination that the Baltic should not become a 'red sea' and to persuade Russia of the futility of its maritime provocations. While a mix of maritime capabilities is necessary to ensure effective deterrence, the deployment and exercising of principal surface combatants is perhaps the most valuable signal of intent. Only these vessels have the capability to ensure control of large areas of the sea. In addition, the more capable sensor suites they carry can make

<sup>55</sup> International Institute for Strategic Studies, *The Military Balance 2019* (London: The International Institute for Strategic Studies, 2019), 100.

<sup>56</sup> "Exercise BALTOPS 2018 begins in Baltic Sea," Naval Technology, 4 June 2018, <https://www.naval-technology.com/news/exercise-baltops-2018-begins-baltic-sea/>; "Finland hosting over 40 vessels for exercise Northern Coasts," *Naval Today*, 11 October 2018, <https://navaltoday.com/2018/10/11/finland-hosting-over-40-vessels-for-exercise-northern-coasts/>.

<sup>57</sup> Naval Striking and Support Forces NATO Public Affairs, "STRIKFORNATO will exercise the integration of Carrier Strike Group Eight during Trident Juncture," U.S. Naval Forces Europe-Africa / U.S. 6th Fleet, 1 November 2018, <https://sfn.nato.int/trje18-8.aspx>; NATO, Naval Striking and Support Forces, "STRIKFORNATO begins exercise Trident Juncture 2018," Naval Striking and Support Forces, 25 October 2018, <https://sfn.nato.int/trje18-3.aspx>.

<sup>58</sup> Dalsjö, *Bursting the Bubble*, 57.

important contributions to MSA, at least on the surface and in the air.

NATO's presence in the Baltic Sea in this role is similar to Russia's conception of the utility of its naval assets, in which the ability to send political signals to opponents and allies is just as important as the ability to fight wars and to support military strategy and operations. NATO principal surface combatants on the Baltic

*A broad NATO peacetime presence is necessary to signal the Alliance's determination that the Baltic should not become a 'red sea' and to persuade Russia of the futility of its maritime provocations*

Sea are also employing armed suasion – or at least its deterrence component. While NATO principal surface combatants on the Baltic Sea in peacetime will not be exercising their most demanding wartime roles, their presence continues to be necessary for this purpose.

As part of its overall effort to be present on the Baltic Sea, NATO's Maritime Command (MARCOM) commands four peacetime standing naval forces, which provide deterrent presence and situational awareness, support exercises and conduct missions, as well as providing the core of the maritime component of the VJTF.<sup>59</sup> Between them, Standing NATO Maritime Group One (SNMG1) and Standing NATO Mine Countermeasures Group One (SNMCMG1) are present in the Baltic Sea for around 300 days each year; however this presence is spread across the entire Baltic and SNMCMG1, the less effective force as far as deterrence is concerned, accounts for the larger share of days. The mission of these standing groups has changed little since the Cold War and, except for periods of major exercises, it can be difficult to generate forces for them.

We recommend that that NATO should take steps to enhance the presence of its warships in the Baltic Sea, in particular in the eastern Baltic. SNMG1 is small (at the time of writing in 2019, it comprises one US destroyer, one Polish

guided missile frigate, and one German tanker). SNMCMG1 is larger (one frigate and three minehunters), but due to a lack of warfighting capability is less of a deterrent presence. NATO's presence should be persistent, unpredictable, imposing, and demonstrating a capability profile tailored to the Baltic environment.

Force generation for this will no doubt strain the Allies, which already face the challenge of providing assets for exercises and operations. However, some measures might be considered to ease this problem. First, the Baltic Sea states should explore options to ease any administrative burdens placed on naval ships as they transit through the territorial waters of their Allies and partners. Developing a maritime military mobility regime, building on the EU/NATO work in the land domain, should also increase the time at sea of visiting vessels.

Second, exercises are an important contribution to training, MSA and awareness. They help the participating states regain skills such as ASW that had faded during the post-Cold War period. And for NATO, exercises are an important tool for developing interoperability, including closer cooperation with Finland and Sweden. At present, however, the exercise schedule is problematic for the Baltic Sea navies, who find it difficult to keep up with the demands placed upon them. While the exercise programme should not be reduced, there is scope for redesigning, or reshuffling the programme to both provide a more logical exercise progression, and to reduce the demands placed on participants.

Third, larger warships, in particular those with an AAW role, have limited training opportunities if they are unable to interface with local C4ISR networks. The Baltic Sea states, especially the three Baltic states, are not able to provide the full range of connectivity that would allow this interfacing, and the Baltic Sea is thus a less attractive training location than it might otherwise be. The Baltic Sea states should investigate options, such as the procurement of Link systems, to enhance connectivity between their own C4ISR networks and visiting warships to provide for better training opportunities in the region.

<sup>59</sup> NATO, Allied Maritime Command, "Maritime Groups," Allied Maritime Command, <https://mc.nato.int/missions/maritime-groups.aspx>.



### 4.3 A BALTIC REGIONAL RESPONSE IN CRISIS AND PEACETIME

**The Baltic Sea states should:**

- recognise their role in countering hostile Russian maritime activity, and the requirement that will be placed on them to establish sea control, in times of crisis;
- take the steps necessary to enhance the readiness of their maritime response and ensure that this issue remains prominent on NATO's agenda;
- enhance their maritime situational awareness, including through more presence at sea;
- identify appropriate frameworks to develop habits of close cooperation in all aspects of activity related to the maritime domain, in order to be able to respond effectively and efficiently to wartime threats, hybrid threats, and hostile activity in peacetime;
- create a Baltic Maritime Group, outside but closely associated with NATO structures, to provide an operating framework for the Baltic Sea navies. It would provide persistent presence, enhance deterrence and be a framework for training and exercises;
- ensure that decision makers are included in meaningful roles in maritime domain exercises to raise awareness and counter sea blindness; and
- recognise the importance of cooperation between naval and constabulary maritime force in countering hybrid threats, and take steps to improve inter-agency cooperation.

As the presence of NATO combatants cannot be counted upon in wartime, the states that border the Baltic Sea will require their own capabilities to ensure credible sea control and to buy time for NATO's reinforcement of the region. The assumption of some decision makers in the Baltic states that Estonia, Latvia and Lithuania should focus on the defence of the land, while NATO should and will take care of the sea, is flawed. The Baltic Sea is not a problem for the rest of NATO – it is a problem for all of NATO.

The Baltic Sea states will need to be able to prevent activities aimed at disabling their ports, protect the final leg of the routes for NATO's reinforcement by sea, and counter or disrupt amphibious operations that might otherwise allow Russia to extend the range of its A2/AD coverage or, for example, insert special operations troops. Further, these states will need to assist in efforts to keep the Baltic Fleet bottled up in Kaliningrad and St Petersburg, or otherwise contribute to degrading maritime (and perhaps also land and air) A2/AD assets in the region. The full range of required capabilities for these tasks is not currently in place. The Baltic Sea states will need to acquire the capabilities to do more to look after their own back yard in higher-end scenarios.

Given the speed with which situations may develop in the confined and shallow waters of the Baltic Sea, the region's navies will also need to develop a culture of readiness similar to that found during the Cold War. NATO has already begun to take steps in this direction with its 'four thirties' readiness plan, which requires the Allies to have 30 combat vessels (as well as 30 mechanised battalions and 30 air squadrons) at 30 days readiness by 2020.<sup>60</sup>

While prudent military planning requires consideration of higher-end scenarios and the planning of responses to them, it is perhaps more likely that the navies of the Baltic Sea states will find themselves dealing with a maritime hybrid event. Identifying, classifying and dealing with hybrid events requires coordination at national and international levels, and extensive local knowledge. The navies of the region, along with their counterparts in the civil agencies, also need to develop postures that ensure that they are credible in these scenarios. Along with a renewed culture of readiness, the navies will need to develop a culture of awareness. This will require, amongst other actions, a more coordinated and more permanent presence at sea, and more effective, shared MSA.

Naval assets are expensive and generally few in number. It appears to be unaffordable in terms of finance and manpower for most of the eight states bordering the Baltic Sea to cover the whole spectrum of coastal naval capabilities alone (see

<sup>60</sup> NATO, "Defence Ministers to agree NATO Readiness Initiative," NATO, 7 June 2018, [https://www.nato.int/cps/en/natohq/news\\_155348.htm](https://www.nato.int/cps/en/natohq/news_155348.htm).

Table 1). Cooperation among the navies of the states of the region, which is at present patchy, will offer opportunities for saving resources, ensuring greater interoperability, simplifying logistics chains, and relieving the strain imposed by the exercise programme. Synergies can be identified and exploited for mutual benefit through NATO's defence planning process, the EU's various capability development initiatives, or on a bilateral/multilateral basis. Further synergies might be achieved by bilateral personnel exchange programmes to build and maintain expertise in areas where the corresponding capability does not yet exist.

	Defence Budget, 2018, US\$ bn	Active Naval Personnel
Denmark	4.25	2 200
Estonia	0.64	400
Finland	3.41	3 500
Germany	45.7	15 900
Latvia	0.68	480
Lithuania	0.89	760
Poland	10.8	7 000
Sweden	6.22	2 100

**Table 1. Defence Budgets and Naval Personnel Numbers<sup>61</sup>**

The Baltic Sea states should thus see the challenges in the maritime domain as shared challenges, best addressed through common solutions. In addition to piecemeal cooperation on individual capability development projects or operations, the inter-national coordination required for both high-end and hybrid scenarios presents a strong case for a systematic regional approach to maritime security across all of its dimensions (see Annex B). Pursuing such an approach would be complicated by the strategic fragmentation of the Baltic region; most obviously, Finland and Sweden are not NATO members, but will inevitably be affected by any military crisis in the region if only to deter and defend against attacks on their own territories. The picture is also complicated by the large number of existing formats (Figure 1) in which the states of the region cooperate, to a greater or lesser extent, in the maritime domain. Finally, it is not immediately obvious which of the Baltic Sea

states would provide the leadership required for a regional approach; Germany perhaps has a key role to play here.

Still, NATO as a whole must be in a position to (re)gain and maintain the initiative in the Baltic Sea at any time, whether visiting principal surface combatants are present or not. This requirement is particularly pertinent when it comes to identifying and countering hybrid threats, for which the presence and readiness of local naval forces is key. As already indicated, greater efforts are required to coordinate the operations of the local navies.

In order to achieve this, we recommend the establishment of a Baltic Maritime Group, which would complement SNMG1 and SNMCMG1 but, in order to fully involve Finland and Sweden, would sit outside (but be closely associated with) NATO structures. The Baltic Maritime Group would provide an operating framework for the navies of the Baltic Sea states – in peacetime, but also in crisis – and also a structure to incorporate ships from other states. The participation of other states, either on an ad hoc basis or through a form of partnership, should be encouraged. Through persistent presence in the Baltic Sea, it would support the building of MSA, enhance deterrence, and also offer a framework for the implementation of training and exercises. These regional operating arrangements should be complemented by regional C2 arrangements, which we discuss below.

*The Baltic Sea states should see the challenges in the maritime domain as shared challenges, best addressed through common solutions*

While coordination among operators is essential, steps are also needed at the political-military level to raise awareness and understanding of the maritime domain and to overcome the sea blindness of many decision makers. With few exceptions, navy headquarters are not located or adequately represented in national capitals – the navies are already on the back foot when it comes to raising awareness of their roles and contribution, and in developing national defence policy. To the greatest extent possible, senior decision makers should be included in

<sup>61</sup> International Institute for Strategic Studies, *The Military Balance*, 99-151



meaningful roles in maritime domain exercises to test and ensure they are adequacy and effectiveness of communications, control, legal, and policy mechanisms.

*Steps are also needed at the political-military level to raise awareness and understanding of the maritime domain and to overcome the sea blindness of many decision makers*

Finally, although not a focus of this report, we recommend that the Baltic Sea states should do more to improve inter-agency coordination. The organisation, platforms and capabilities of the Finnish Navy and Border Guard, the national authorities they operate under, the intra-state cooperation between the Finnish Navy, Border Guard and other maritime authorities under the Ministry of Traffic and Communications, and their international cooperation with Sweden could perhaps serve as a model for how a small state with significant maritime interests incorporates its naval and constabulary forces to provide maritime security and integrate into a total defence strategy.

*The development and implementation of MSA constitutes the greatest challenge to the navies of the Baltic Sea states*

#### 4.4 MARITIME SITUATIONAL AWARENESS

**The Baltic Sea states should:**

- raise the issue of data sharing to the political-military level (or national equivalents for interagency sharing) in order to improve the prospects for enhancing current sharing arrangements;
- ensure that technical solutions for data sharing are in place and regularly exercised, even if there are obstacles to day-to-day sharing; and
- acquire the capabilities to be able to at least detect and identify with radar and visual means all Russian naval ships as they transit through their Exclusive Economic Zones.

The development and implementation of MSA constitutes the greatest challenge to the navies of the Baltic Sea states. Its importance is recognised and understood by operators, yet there are substantial obstacles to the implementation of systems to enhance MSA and allow the creation and sharing of an RMP. These obstacles are primarily political and legal, and reflect the unwillingness of data collectors to share information between agencies and with other states. Due to the short reaction times and the situational complexity usually found in the Baltic Sea, any effort to improve the current situation will bring great benefit. A valid RMP, below and above the surface and in the air is a prerequisite for the maintenance of security in the Baltic Sea.

There are two international organisations dealing with Baltic maritime surveillance. The European Defence Agency launched its maritime surveillance project (MARSUR) in 2006. MARSUR has grown to include nineteen members (including all states in the Baltic Sea region except Denmark, Estonia and Russia). MARSUR facilitates the exchange of ship tracking data and imagery.<sup>62</sup> Sea Surveillance Co-Operation Baltic Sea (SUCBAS) was formed in 2008 and today includes all states in the Baltic Sea region except Russia, and also the UK. SUCBAS serves as a venue for voluntary, unclassified information exchange, with the mission of generating greater situational awareness in the Baltic Sea.<sup>63</sup> Its origins lie in Sea Surveillance Cooperation Finland Sweden (SUCFIS), which has grown in parallel to involve a much deeper level of surveillance cooperation, including a shared RMP, between its two members.<sup>64</sup> In addition, MARCOM builds and distributes a maritime picture for its entire area of responsibility. These organisations however, with the possible exception of SUCFIS, suffer from the unwillingness of data providers to share the information necessary to build a comprehensive picture.

<sup>62</sup> European Union, European Defence Agency, "Maritime Surveillance."

<sup>63</sup> SUCBAS, "SUCBAS Main Objectives," SUCBAS, <http://suchbas.org/objectives/>.

<sup>64</sup> Edward Lundquist, "Baltic Maritime Security," *Maritime Journal*, 17 May 2016, <https://www.maritimejournal.com/news101/security-and-alarm-systems/baltic-maritime-security>.

The issue of Baltic MSA has been studied in some depth by analysts at the Centre for Strategic and International Studies. Among their priority recommendations are: the creation of a Baltic MSA analytical cell; the creation of

*It is important to recognise the value of persistent presence at sea; in particular for dealing with hybrid situations*

a Baltic Sea data environment to include both NATO and partner states; the integration of sub-surface sensors and ASW; and the acquisition of sonobuoys and acoustic processing systems.<sup>65</sup> In addition, it is important to recognise the value as discussed above, of persistent presence at sea; in particular for dealing with hybrid situations, in which the ability of local expertise to identify abnormal activities is paramount.

In order to improve the prospects for enhanced data sharing we recommend that this issue is raised to the political-military level, or national equivalents for inter-agency sharing. These efforts should also form part of the broader approach to raise awareness of the maritime domain amongst decision makers and to combat sea blindness. At the operator/technical level it is important that technical solutions should be put in place and exercised, even if political, legal, and classification restrictions that prevent day-to-day sharing remain in peacetime. It should not be assumed that sharing can be effortlessly put in place in the event of a crisis.

In terms of level of ambition, we recommend that all Baltic Sea states should, as a minimum, be able to detect and identify with radar and visual means all Russian naval ships as they transit through their EEZs, and to hand such contacts off to their neighbours. Further, they should be able to shadow any vessels that are not transiting normally or are otherwise acting suspiciously, both as a contribution to greater MSA and as a deterrent against malicious actions. The goal of detecting submarines in critical approaches should be considered in the future, if the technologies for unmanned solutions prove to be affordable.

<sup>65</sup> Andrew Metrick and Kathleen Hicks, *Contested Seas. Maritime Domain Awareness in Northern Europe* (Washington DC: CSIS; Lanham: Rowman and Littlefield, 2018), 44-49.

In some cases, this will require the upgrade of sensor systems, and closer cooperation between naval and constabulary forces. Ideally, sufficient military surveillance assets should be in place to provide for redundancy in the event of loss or failure. Where this is not possible, civil sensors that contribute to MSA should at least be sufficiently resilient to operate in an adverse electronic warfare environment.

## 4.5 COMMAND AND CONTROL

### NATO should:

- increase the number of naval staff officers at Joint Force Command Brunssum; and
- regularly exercise the augmentation of Maritime Command and the deployment of its deployable elements.

### The Baltic Sea states should:

- treat as a priority the secondment of staff officers to Maritime Command's Baltic Sea regional maritime coordination function; and
- offer their fullest support both politically, and practically to the building of the Baltic Maritime Component Command.

### Germany should:

- commit fully to the leadership role necessary to build the Baltic Maritime Component Command into a structure for effective regional coordination in peacetime and command and control in crisis;
- regularly exercise the augmentation of the Baltic Maritime Component Command and the deployment of its deployable elements; and
- make special efforts to involve Finland and Sweden in the Baltic Maritime Component Command.

NATO's command structure for the Baltic region maritime domain has two principal components below the strategic and military/strategic level at NATO Headquarters and Allied Command Operations. At the operational level, Joint Force Command Brunssum (JFCBS) would manage joint operations in the Baltic

region during a crisis. At the tactical level, MARCOM, in Northwood UK, would manage joint maritime operations. MARCOM is both the principal maritime adviser to the Supreme Allied Commander Europe and, following NATO's 2015 command structure adaptation, the theatre maritime component commander for operations. MARCOM would not, however, expect to retain this role throughout a crisis, but would act as a 'first responder' before handing responsibility over to another headquarters.

*JFC Brunssum lacks the maritime expertise necessary to effectively exercise its role as an operational commander in the maritime domain*

It is evident that JFC Brunssum, inescapably a land-heavy headquarters, lacks the maritime expertise necessary to effectively exercise its role as an operational commander in the maritime domain. This places a burden on lower level headquarters, in particular MARCOM. We recommend that steps are taken, for example adjustments to the staff plot, to build and then to exercise more maritime expertise at JFC Brunssum.

While MARCOM has grown to reflect its new task (from around 300 to around 500 personnel) it would still need to be augmented to fulfil the component command role during a crisis. Further, MARCOM lacks expertise in the particularities of the Baltic Sea and is in the process of creating a Baltic Sea regional maritime coordination function to mirror similar arrangements it already has in place for the Black Sea. This is not a command function, but a team with regional expertise tasked with maintaining close linkages with the regional navies.<sup>66</sup> This is a laudable effort and we recommend that the navies of the Baltic Sea states should give priority to the secondment of officers to staff this coordination function.

<sup>66</sup> NATO, Allied Maritime Command, "COM MARCOM Remarks on MARCOM Addressing Contemporary Maritime Security Threats," remarks to the German Council on Foreign Relations, 22 May 2017, Allied Maritime Command, 26 May 2017, <https://mc.nato.int/media-centre/news/2017/com-marcom-remarks-on-marcom-addressing-contemporary-maritime-security-threats.aspx>.

However, MARCOM's area of responsibility is large and, at present, there is no regional headquarters to generate local expertise of the Baltic Sea in peacetime and to command operations there in crisis and war. In response, Germany has agreed to establish under the Framework Nations Concept a multinational Baltic Maritime Component Command (BMCC) in Rostock. The BMCC is planned to achieve initial operating capability in 2023 and full operating capability in 2025. Germany's naval staff will form the core of the Command – around 75 of the hundred or so posts – which will be collocated with the national Maritime Operations Centre. The BMCC will be available to NATO and could, in times of crisis, be augmented to provide command and control for regional maritime NATO operations. It is eventually expected to

be deployable. In peacetime, it would encourage coordination between the navies of the states surrounding the Baltic Sea, for example in thinking about operations specific to the environment of the Baltic Sea, exercises, cooperation with civil agencies, and measures to improve MSA. In support of this role, Germany has also convened a Baltic Commanders' Conference, a yearly meeting of the regional Chiefs of the Navies, which is expected in due course to be coordinated by the BMCC.

*Maritime command and control arrangements for the Baltic region are in the process of developing to meet the challenges of an increasingly complex environment*

Maritime command and control arrangements for the Baltic region are thus in the process of developing to meet the challenges of an increasingly complex environment. The roles and responsibilities of the various headquarters involved are, in 2019, not fully clear and are developing with limited central direction or oversight. This is probably inevitable, given that MARCOM is a NATO headquarters while the BMCC is a German-led multinational headquarters, and need not be a problem if these organisations make the effort to communicate with and to understand each other.

It is our assessment that the BMCC has a critical role to play in these emerging structures. It is unlikely that MARCOM will be able to develop

the deep regional expertise necessary to understand and be able to respond to the maritime challenges of the Baltic region and, in a serious crisis, MARCOM is unlikely to have the breadth necessary to execute command and control across its entire area of responsibility.

*Germany's agreement to create a BMCC is a welcome one*

We recommend, therefore, that Germany should commit fully to the leadership role necessary to build at the BMCC a structure able to execute effective C2 in crisis and coordination of the region's navies in peacetime. In peacetime, the BMCC should liaise with the region's navies with a view to coordinating naval activity, including exercises and presence operations in the Baltic Sea, and to promoting deep expertise in operations in the local environment. In due course, it should absorb, from MARCOM, the Baltic Sea regional maritime coordination function – in the meantime, MARCOM and the BMCC should work to clarify their roles with respect to each other. Furthermore, the BMCC should establish operational links with the headquarters available to the NATO force structure that may have a role in Baltic region operations: HQ Multinational Corps North-East, HQ Multinational Division North East, and the soon to be established HQ Multinational Division North.

In anticipation of its role in crisis and wartime, the BMCC should prepare maritime Concepts of Operations and defence plans for the region, with the assumption that, in a crisis, it will be the prime choice of headquarters to take on the role of theatre component commander from MARCOM. MARCOM would then coordinate the provision of available NATO naval forces to the BMCC. In support of their roles, both the BMCC and MARCOM should exercise augmentation for their crisis and wartime roles, and exercise the deployment of their deployable elements.

The other states of the Baltic region, meanwhile, should offer their fullest support both politically, and practically – for example in staffing positions in the BMCC and in providing resources to support its agenda. As a non-NATO headquarters, the BMCC should make special efforts to involve Finland and Sweden as closely as possible as one step in overcoming the strategic fragmentation of the Baltic region.

In short, Germany's agreement to create a BMCC is a welcome one. Germany has demonstrated

its readiness to provide the leadership in the maritime domain that the other states of the region expect. It should be assertive and

ambitious in developing this headquarters, and should be able to rely on the other states of the region to provide appropriate levels of support. To echo the conclusions of the 2018 Kiel International Seapower Symposium, not only MARCOM, but the BMCC should seek to rectify areas of weakness and concern in the present situation through the building of postures that identify the responsibilities of individual states, and the promotion of the high-low mixes of maritime assets that would allow navies the flexibility to prosecute their three functions of strategy, security and warfighting.<sup>67</sup>

## 4.6 CAPABILITY ISSUES

### The Baltic states should:

- continue to operate and improve their mine countermeasure capability;
- invest in mine-laying capabilities to protect key infrastructure from attack from the sea and deny access to other vital areas;
- invest in small, multi-purpose naval vessels to provide capabilities for anti-submarine and anti-surface warfare, command and control, and enhanced maritime situational awareness;
- in order for multi-purpose vessels to be affordable, acquire, command and operate them on a common basis;
- consider where unmanned vehicles can be used alongside multi-purpose vessels to complement the capabilities these platforms offer; and
- consider also investing in land-based coastal defence missiles, to secure sea lines of communication and protect coastlines.

The Baltic Sea states do not have the full range of capabilities required to exercise sea control in the Baltic in times of crisis. An improved set

<sup>67</sup> "Allied Maritime Strategy – A Theory for Success," Kiel International Seapower Symposium 2018 Conference Report, 29-30.

of capabilities would not only help these states to fulfil this role, but would also contribute to enhanced deterrence and MSA presence in peacetime, and an improved ability to detect and deal with hybrid threats.

*The Baltic Sea states do not have the full range of capabilities required to exercise sea control in the Baltic in times of crisis*

Just as navies throughout NATO and the EU are receiving greater attention and investment, modernisation efforts are underway in most states of the region (see Annex A). It should be a longer term goal of all Baltic Sea states that their capability acquisition should be coordinated, to a far greater extent than at present, through the NATO and EU defence planning processes and through regional and bilateral initiatives, in order that new capabilities are, at the very least, complementary. This broader agenda is beyond the scope of our report and we make no further recommendations here.

*The navies of the Baltic states are all approaching the point at which their main assets – MCM vessels – are simultaneously reaching the ends of their useful lives*

We also do not make specific capability recommendations for the individual Baltic Sea states; except for the three Baltic states of Estonia, Latvia and Lithuania. The navies of the Baltic states are all approaching the point at which their main assets – MCM vessels – are simultaneously reaching the ends of their useful lives. The three navies thus face the far-reaching question of whether they should continue to focus on this important capability or whether they should diversify. The fact they all face this question at the same time opens the door to closer Baltic cooperation in the maritime domain in the future.

#### 4.6.1 THE THREE BALTIC STATES

The three Baltic navies are presently trapped by their early investments in MCM. This capability was developed with international (principally

German) support in the late 1990s, when the Baltic navies had few resources and very limited experience of wider naval operations. MCM remains an important capability for operations in the Baltic Sea. It must be retained, but retaining this capability alone will prevent the three Baltic navies from becoming mature maritime organisations, able to fulfil a range of the tasks that are essential to the security of a coastal state, and able to cooperate on an equal basis with the navies of other states.

The simultaneous end of life of the MCM vessels in all three states in the second half of the coming decade provides an opportunity to set the three

*Mines can be decisive in the defence of a small coastal state*

navies on a fresh path to building broader naval capability, able to take greater role in delivering national security. In addition to retaining – and continuing to improve – MCM capability, we recommend the following three priorities for development in the maritime domain in the Baltic states.

First, the Baltic states should develop more comprehensive mine-laying capabilities. Mines are frequently seen as unpalatable weapons, but they can be decisive in the defence of a small coastal state. Finland, for example, uses mines as a key aspect of its overall maritime strategy and is highly proficient in both offensive and defensive naval mining.<sup>68</sup> While mines can be laid from any number of vessels (and aircraft), it will be important not to take an ad hoc approach to building this capability. A comprehensive mine laying capability will also require, for example, adequate ordnance stocks, plans, and training.

Second, the three states should invest in small, multi-purpose naval vessels to satisfy (on a limited scale) crisis-time requirements for anti-submarine and anti-surface warfare. Such vessels will provide naval C2 and a contribution to MSA, and are thus valuable in hybrid situations. They can also be used for mine-laying. The three

<sup>68</sup> Metrick, *Contested Seas*, 29.



states should also consider where unmanned vehicles can be used alongside these platforms to execute certain tasks and complement the capabilities that multi-purpose naval vessels offer. The multi-role Squadron 2020 corvette that Finland is building serves as an example of how a coastal navy might address multiple capability requirements at reasonable cost.<sup>69</sup>

*There is a fair case to be made that the Baltic states are underperforming in the maritime domain, and that the balance of investment with other domains should be redressed*

If multi-role corvettes are not affordable, the surface ship threat might be addressed with missile patrol boats. These are less vulnerable to hostile submarine-launched torpedoes, but may be more limited in their capabilities for anti-submarine warfare.

This is an expensive recommendation. The procurement cost alone of the Finnish Navy's four corvettes is estimated at €1.2 billion.<sup>70</sup> On the other hand, sea blindness has especially been an issue in the three Baltic states, as evidenced by the lack of any significant investment in their navies beyond the creation and maintenance of their MCM capabilities. There is a fair case to be made that the Baltic states are underperforming in the maritime domain, and that the balance of investment with other domains should be redressed.

Still, even if naval development is given high priority, a capability such as we recommend is likely to be unaffordable on an individual basis. The simultaneous need to replace the existing fleets of the Baltic states, however, creates an opportunity for the three navies to share costs and risks through closer cooperation. Rather than thinking solely of national fleets, the three Baltic states should take the far-reaching decision to acquire, command and operate this capability on a shared basis. One model, for example, might involve the continuous rotational assignment of one or more multi-purpose vessels (commonly acquired, commonly maintained, with commonly trained crews) to a Baltic states

maritime headquarters for common operations, while other vessels were retained under national command for national tasks. Without such an approach, which would doubtless present substantial political and practical challenges, the navies of the Baltic states are likely to remain peripheral to the Baltic naval community.

Third, the Baltic states should also consider investing in capabilities for coastal defence. Securing SLOCs and protecting coastlines will be key roles for the Baltic defence forces in times of crisis. While this can be done from the sea using the platforms described above, a combination of sea-based platforms and land-based mobile missile systems coupled with drones to provide eyes over the horizon, may provide advantages in cost, resilience and operational effect.

## CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

As NATO places greater emphasis on its core mission of collective defence and deterrence, more attention is being paid to the maritime domain – a domain that had been neglected after the end of the Cold War when NATO focused largely on crisis response operations. Exercises in the Atlantic, the recognition of the need to rebuild key maritime capabilities such as ASW, the enhanced role given to MARCOM in NATO's latest command structure review, and the efforts of individual Allies to regenerate naval power are among the developments that testify to the Alliance's renewed seriousness about maritime issues. Nonetheless, sea blindness remains a concern, in particular in the three Baltic states.

Russia, which is the only conceivable source of military threat to security in the Baltic region, presents a range of challenges to NATO, its Allies and partners in the Baltic Sea. In peacetime, the Russian Navy attempts to exert undue influence in the Baltic and behaves provocatively towards Allied shipping and other Allied interests. In pre-crisis and crisis, the confined and shallow nature of the Baltic, the volume of traffic it typically contains, and its economic and social

<sup>69</sup> Ministry of Defence (Finland), "Squadron 2020," Ministry of Defence, [https://www.defmin.fi/en/administrative\\_branch/strategic\\_capability\\_projects/squadron\\_2020](https://www.defmin.fi/en/administrative_branch/strategic_capability_projects/squadron_2020).

<sup>70</sup> Ibid.

importance to all the surrounding states present multiple opportunities for hybrid actions. And in wartime, the Baltic Sea would be a vital reinforcement and resupply route for NATO's defence efforts. Further complicating matters, the geopolitical situation of the Baltic region is multidimensional, with an interweaving array of security and cooperative frameworks; while at a more practical level the special physical and human environments of the Baltic Sea create substantial problems – but perhaps also opportunities – for maritime operators.

In light of this, it is essential that NATO continues and enhances its naval presence in the Baltic Sea, including through the deployment and exercising of principal surface combatants, to deter Russia. But it is also necessary for the states bordering the Baltic Sea to do more to secure their maritime environment. Identifying hybrid actions, perhaps the most likely form of Russian challenge in the Baltic maritime domain, requires local expertise and continuous presence at sea to ensure situational awareness and the recognition of unusual patterns, and a range of means for effective response. In times of crisis, many of NATO's warships will be engaged in the protection of transatlantic SLOCs and the GIUK gap. The Baltic Sea states will thus need to be able to establish and maintain sea control to protect Baltic SLOCs, ports and other critical infrastructure, to counter amphibious operations and to disrupt the actions of the Baltic Fleet. The capabilities required to achieve these tasks are not fully in place; neither are the arrangements for cooperation among the Baltic Sea states that are necessary to enhance efficiency and effectiveness.

In order to redress this situation, we recommend that:

#### NATO should:

- continue to monitor Russian naval developments;
- place greater emphasis on the threats posed by hybrid maritime operations and explore possible means to counter them;
- place greater emphasis in their strategic messaging on Russia's substantial economic dependence on the Baltic Sea, and its vulnerability to the disruption of trade flows in the region;
- continue to deploy and exercise principal surface combatants on the Baltic Sea;

- enhance its overall naval presence in the Baltic, in particular in the eastern Baltic;
- ease force generation problems for deterrence operations by reorganising its exercise programme;
- increase the number of naval staff officers at Joint Force Command Brunssum; and
- regularly exercise the augmentation of Maritime Command and the deployment of its deployable elements.

#### The Baltic Sea states should:

- ease force generation problems for deterrence operations by exploring options to improve maritime military mobility;
- investigate options to enhance connectivity between their own command, control, communications, computer, intelligence, surveillance and reconnaissance systems networks and visiting warships to provide for better training opportunities in the region;
- recognise their role in countering hostile Russian maritime activity, and the requirement that will be placed on them to establish sea control, in times of crisis;
- take the steps necessary to enhance the readiness of their maritime response and ensure that this issue remains prominent on NATO's agenda;
- enhance their maritime situational awareness, including through more presence at sea;
- identify appropriate frameworks to develop habits of close cooperation in all aspects of activity related to the maritime domain, in order to be able to respond effectively and efficiently to wartime threats, hybrid threats, and hostile activity in peacetime;
- create a Baltic Maritime Group, outside but closely associated with NATO structures, to provide an operating framework for the Baltic Sea navies. It would provide persistent presence, enhance deterrence and be a framework for training and exercises;
- ensure that decision makers are included in meaningful roles in maritime domain exercises to raise awareness and counter sea blindness;
- recognise the importance of cooperation between naval and constabulary maritime force in countering hybrid threats, and take steps to improve inter-agency cooperation;
- raise the issue of data sharing to the political-military level (or national equivalents for

interagency sharing) in order to improve the prospects for enhancing current sharing arrangements;

- treat as a priority the secondment of staff officers to Maritime Command's Baltic Sea regional maritime coordination function;
- offer their fullest support both politically, and practically to the building of the Baltic Maritime Component Command;
- ensure that technical solutions for data sharing are in place and regularly exercised, even if there are obstacles to day-to-day sharing; and
- acquire the capabilities to be able to at least detect and identify with radar and visual means all Russian naval ships as they transit through their Exclusive Economic Zones.

#### Germany should:

- commit fully to the leadership role necessary to build the Baltic Maritime Component Command into a structure for effective regional coordination in peacetime and command and control in crisis;
- regularly exercise the augmentation of the Baltic Maritime Component Command and the deployment of its deployable elements;

and

- make special efforts to involve Finland and Sweden in the Baltic Maritime Component Command.

#### The Baltic states should:

- continue to operate and improve their mine countermeasure capability;
- invest in mine-laying capabilities to protect key infrastructure from attack from the sea and deny access to other vital areas;
- invest in small, multi-purpose naval vessels to provide capabilities for anti-submarine and anti-surface warfare, command and control, and enhanced maritime situational awareness;
- in order for multi-purpose vessels to be affordable, acquire, command and operate them on a common basis;
- consider where unmanned vehicles can be used alongside multi-purpose vessels to complement the capabilities these platforms offer; and
- consider also investing in land-based coastal defence missiles, to secure sea lines of communication and protect coastlines.

## ANNEX A. THE NAVIES OF THE BALTIC REGION

In this Annex, we briefly survey the current naval capabilities of the states that surround the Baltic Sea.

### A.1 RUSSIA

Despite some general scepticism, even ridicule, of deployments and operations involving legacy ships such as the aircraft carrier *Admiral Kuznetsov*, Russia's naval forces have made some serious progress in their modernisation efforts.<sup>71</sup> Strengthening the Northern Fleet, especially its submarine capabilities, has been a clear priority, underlining the salience of the Arctic Ocean and the North Atlantic in Russia's strategic thinking and planning.

Although the Baltic Fleet is the smallest of Russia's naval formations, it is the largest naval force in the Baltic Sea. The Baltic Fleet inventory is dominated by legacy platforms (some of which have been or will be modernised) and contains only one operational *Kilo* class submarine. However, more than half of the surface combatants are corvettes of different classes that are well suited for the Baltic Sea's operating environment. The fleet has already received four new *Steregushchiy* class corvettes fitted with advanced stealth, radar and electronic warfare systems and armed with SS-N-25 anti-ship missiles as well as torpedoes. Two more such ships are to be delivered in the coming years. It has also received two *Buyan-M* class corvettes with vertical missile launch systems that can be armed with the *Kalibr* family of land attack (SS-N-30A, with a range of 1 500-2 500 km) or anti-ship (SS-N-27 Sizzler, range 220-300 km) cruise missiles. There are also plans to increase the number of *Kilo* class submarines in the Baltic Fleet in the future, enhancing both stand-off sea-launched missile strike capability and the sub-surface threat to NATO's SLOCs in the Baltic Sea.

The Baltic Fleet also has a fairly robust MCM capability, and retains significant stocks of naval

mines that could further reinforce an A2/AD approach by complicating NATO's access to the main sea ports of debarkation in Poland and the Baltic states. The fleet is supported by naval aviation units and, contributing to its role as a bastion defender, is equipped with land-based *Bastion* mobile coastal defence systems (SS-C-5 Stooze, range 350 km). From the Kaliningrad exclave, their range is sufficient to leave only a narrow sliver of international waters in the western part of the Baltic Sea safe for maritime traffic.

Russia's amphibious landing capability in the Baltic Sea is modest and based on a small number of ageing platforms (four *Ropucha* class and two *Zubr* class landing ships). But with close air support from naval aviation (including the organic helicopter fleet) and fire support from the sea, it would be capable of limited-scale yet high-impact operations. If directed against sensitive and poorly defended coastal areas, amphibious capability could deliver a strategic shock or, by capturing an island to position long-range air defence systems, help to extend the A2/AD zone farther to the West and North. The fleet also has a research ship, *Admiral Vladimirov*, potentially suitable as a platform to conduct intelligence gathering and to act against undersea critical infrastructure.

Given its vision of developing a balanced naval fleet by 2030, Russia might be expected to eventually possess a mix of platforms and systems in the Baltic Sea, well suited for operations in the environment and for supporting broader strategy. Just as importantly, Russia is able to quickly and flexibly reinforce the Baltic Fleet with additional assets from other formations (provided that SLOCs are open) to strengthen its strategic impact – much as it has done in other theatres in recent years.<sup>72</sup>

### A.2 THE BALTIC STATES

Estonia, Latvia and Lithuania have the smallest and least capable navies of the Baltic Sea states. They possess no ASuW, ASW or AAW capabilities, but their capabilities for MSA are improving; MSA is one of the defence development priorities of the three states. The most developed capability in the Baltic

<sup>71</sup> Michael Kofman and Jeffrey Edmonds, "Why the Russian Navy Is a More Capable Adversary Than It Appears," *The National Interest*, 22 August 2017, <https://nationalinterest.org/feature/why-the-russian-navy-more-capable-adversary-it-appears-22009>.

<sup>72</sup> International Institute for Strategic Studies, *The Military Balance*, 175.

states' navies is MCM – a capability that has provided for sustained national contributions to SNMCMG1 and various multinational exercises as well as serving as a basis for the trilateral naval cooperation project, BALTRON.<sup>73</sup> BALTRON was the mainstay of the national defence policies of the three states in the maritime domain for almost two decades; however Estonia withdrew from the project in 2015.<sup>74</sup> In general, the national defence strategies and concepts of the three countries have given little consideration to the maritime domain and have operated under the assumption that in the event of crisis or war, NATO would take care of the Baltic Sea, hence the Baltic states should focus on sustaining their MCM contribution.

Despite abundant policy rhetoric about coordinated joint procurements, cooperation and synergy, all three countries operate different types of MCM platforms and, in the case of Latvia and Lithuania, also different types of patrol ships. The Estonian Navy operates three UK-built *Sandown* class MCM ships and one command and support vessel (of the Danish-built *Lindormen* class). The Latvian Naval Forces are equipped with five Dutch-built *Tripartite* class MCM ships, one *Vidar* class (ex-Norwegian) minelayer used as a command and support vessel for the MCM squadron, one hydrographic survey vessel, five *Skrunda* class patrol ships, and a number of small coast guard vessels. The Lithuanian Naval Forces operate four UK-built *Hunt* class MCM ships, one *Vidar* class minelayer, again used as a command and support vessel for the MCM squadron, four Danish-built *Flyvefisken* class patrol ships (sometimes referred to as 'multipurpose ships'), and several auxiliary vessels.

These limited capabilities mean that the range of tasks the Estonian, Latvian and Lithuanian naval forces are able to fulfil in peacetime, crisis (including hybrid scenarios) and war is quite constrained. They can provide a degree of peacetime presence in their territorial waters and EEZs (but not on a 24/7 year-round basis

due to shortcomings in readiness), respond to certain types of hybrid activity (e.g. involving the use of naval mines or the use of civilian ships for sabotage or camouflaged military action) and also respond to some of Russia's provocative naval activities such as violations of territorial waters. The platforms operated by the three navies can be used: for intelligence gathering and observing Russia's exercises and other naval activities; for ship boarding teams (police, customs, military) to interdict and inspect suspicious civilian ships; and for search and rescue (SAR) duties at sea. However, in wartime, their role would be largely limited to contributing to MSA and de-mining local SLOCs which might be used to bring reinforcements to Baltic ports. In more conceptual terms, Estonia defines the purpose of its naval defence efforts as, "preventing the establishment of sea control in its area of responsibility and creating prerequisite conditions for NATO to gain control on the Baltic Sea, and supporting the maintenance thereof."<sup>75</sup>

Beyond modernising existing platforms, some investments in command, control, communications and intelligence capability, and further developing MSA, the Baltic states do not envisage any major quantitative or qualitative developments in their navies in the next 10 years. However, discussions are underway on possible common Baltic solutions to the capability gap that will emerge once the current platforms reach the end of their life-cycles in all three states in the late 2020s.

### A.3 DENMARK, GERMANY, AND POLAND

The NATO states of Denmark and Germany possess among the most modern navies in the Baltic region, while neighbour Poland has struggled both to define its maritime ambitions and to reconcile these with an ageing and underfunded fleet.

#### A.3.1 DENMARK

In the decades that followed the end of the Cold War, the Royal Danish Navy shifted from being primarily a littoral force to a fleet capable of participating in blue water operations in

<sup>73</sup> "Agreement between the Government of the Republic of Latvia, the Government of the Republic of Estonia and the Government of the Republic of Lithuania Concerning the Establishment of the Baltic Naval Squadron," Likumi.lv (Latvijas Vēstnesis), <https://m.likumi.lv/doc.php?id=213544>.

<sup>74</sup> BNS, "Estonia to pull out of Baltic mine countermeasures squadron," *Postimees*, 8 January 2015, <https://news.postimees.ee/3049303/estonia-to-pull-out-of-baltic-mine-countermeasures-squadron>.

<sup>75</sup> Estonian Navy, *Estonian Military Defence at Sea: Capstone Concept* (Tallinn: Estonian Navy, 2017), 7.



support of international missions. In response to recent changes in the security environment, Denmark's latest defence agreement, which covers the period 2018-23, places greater emphasis on the protection of the Baltic region and on contributing to collective deterrence and defence.<sup>76</sup> The Royal Danish Navy, however, continues to see its role here as a blue water one, primarily: in the North Sea, protecting naval task groups participating in counter A2/AD missions; in defending the GIUK gap, where Denmark has defence commitments towards the Faeroe Islands and Greenland; and in protecting SLOCs in the Atlantic. Denmark is thus unlikely to be a player in the Baltic Sea in times of crisis, although exercising and showing presence in peacetime are still important roles.

This shift in approach has been mirrored by a shift in capabilities, with investment focused on a fleet of three very capable multi-purpose frigates: the *Iver Huitfeldt* class. These entered service in 2012-13 and are equipped with a vertical launch missile system that can fire anti-air, anti-submarine and anti-ship missiles.<sup>77</sup> The *Iver Huitfeldt* class frigates are complemented by two, somewhat older, *Absalon* class frigates/support ships, also able to carry out several warfighting roles. In addition to the frigate fleet, the Navy operates several patrol and coastal vessels, MCM ships, and logistic support vessels.<sup>78</sup>

The latest defence agreement reinforces the Navy's shift towards higher-end blue water operations, with a commitment to enhance the AAW capability of the frigates, including through the acquisition of Standard-Missile 6 air and ballistic missile defence missiles, and to rebuild ASW capability. This will include the provision of new sonar equipment for the frigates, dipping sonar and torpedoes for Defence Forces helicopters, and counter-torpedo systems. The defence agreement also requires measures to ensure that the Royal Danish Navy retains the knowledge required to conduct mine laying operations.<sup>79</sup>

<sup>76</sup> Ministry of Defence (Denmark), "Agreement for Danish Defence 2018 – 2023," Ministry of Defence, 1 February 2019, <https://www.fmn.dk/eng/allabout/Pages/danish-defence-agreement.aspx>.

<sup>77</sup> Naval Technology, "Ivar Huitfeldt Class," Naval Technology, <https://www.naval-technology.com/projects/ivar-huitfeldt-class/>.

<sup>78</sup> International Institute for Strategic Studies, *The Military Balance*, 100.

<sup>79</sup> Ministry of Defence (Denmark), "Agreement for Danish Defence."

### A.3.2 GERMANY

Despite the reduced numbers that resulted from the post-Cold War drawdown, the Germany Navy still operates nine (soon to be 11) frigates, five corvettes, six submarines, 11 MCM vessels, 11 fleet support ships and three intelligence, surveillance and reconnaissance (ISR) ships, thus maintaining a balanced capability profile in extended air defence and AAW, ASuW, ASW, MCM, ISR, naval special forces, deployable maritime logistics and Naval Air (eight MPA, 40 helicopters). The naval portfolio also includes a small amphibious capability ("Seebataillon") operated in cooperation with the Netherlands. Germany lacks higher-end power projection capability such as amphibious strike or aircraft carriers. A combination of the challenges of the new security environment, readiness problems throughout the Bundeswehr, and the expectation among at least some German leaders that Germany should take a more forward leaning role in defence, has made the case for further development of the Navy.

In her foreword to Germany's 2016 defence white paper, which provides high-level guidance for Germany's defence policy and planning, Defence Minister von der Leyen states that the Bundeswehr "practices 'leadership from the centre' by assuming a leading role among partners."<sup>80</sup> This best describes the German attitude towards leadership: not to dominate but to facilitate, which has been expressed in practical terms through, for example, Germany's championing of NATO's Framework Nation Concept and, in the maritime domain, Germany's plans to lead a multinational maritime component command in Rostock.

More detailed guidance for the armed forces is provided in the Bundeswehr Concept, which directs that the German Navy should retain capabilities for national and collective defence in all the seas of NATO's area of responsibility, including capabilities for littoral warfare, and also capabilities for participation worldwide in international crisis management. It says further that NATO's northern flank and the Baltic Sea are increasingly important and – in an uncharacteristically strong statement – that the deployment of forces and their sustainable

<sup>80</sup> Federal Ministry of Defence (Germany), *White Paper 2016 on German Security Policy and the Future of the Bundeswehr* (Berlin: Federal Ministry of Defence, 2016), 9.

logistic support across the Baltic Sea is of the highest relevance with regard to credible deterrence and the protection and defence of the NATO members bordering the Baltic Sea. It also notes the paramount importance of the unimpeded use of the SLOCs between North America and Europe, and to the Baltic states, and the need to enable access to regions that might be subject to an adversary's A2/AD capabilities. This renewed emphasis on multi-dimensional naval warfare will require contributions to NATO's missile-defence and an ability to conduct effective engagement from the sea ashore, for example with special forces or limited amphibious operations. Underwater warfare and extended air-defence will remain focal elements of German naval capabilities.<sup>81</sup>

Germany's rediscovery of the importance of the Baltic Sea has led to plans to enhance its littoral warfare capability by doubling the number of *K130* class corvettes to ten, modernise the MCM component and increase the number of submarines to eight (all with air-independent propulsion systems, ASuW and ASW capability). In addition, the three AAW frigates will be fitted with a ballistic missile defence-capable sensor suite, and ASW capability will be enhanced by the replacement of the four *123* class ASW frigates through the Multi-role Combat Ship 180 project. Further acquisitions of tanker and support ships will see the German Navy grow from the current 46 units to a total of 60. In the maritime air domain, meanwhile, the ageing Sea King helicopters will be replaced by the NH90 Sea Lion.

Germany's emphasis on the Baltic Sea should not, however, be overstated as Germany considers the northern flank, including the Baltic Sea, as a single operational space. In times of crisis or war, while parts of the German Navy may, depending on the situation, be available for operations in the Baltic Sea, others will most likely be employed in the North Sea and eastern Atlantic/GIUK gap. These operational priorities were outlined in January 2019 by the Chief of the German Navy, who stated during his annual address to his service:

For the German Navy, the geographical focus in collective defence lies upon the North At-

lantic as well as the North Sea and the Baltic Sea. The German Navy needs to be able to help securing the transatlantic SLOCs and to contribute with its own forces across the whole area of the Alliance ... Furthermore, we need to provide the Standing Naval Forces, whom we have supported over decades in an over-proportional manner, with more visibility and relevance. Their importance for the VJTF needs stronger recognition.<sup>82</sup>

### A.3.3 POLAND

Following the collapse of the Warsaw Pact in 1989, Poland inherited a number of surface vessels primarily designed to support maritime landing operations, and a *Kilo* class submarine. In the early 2000s, it acquired several platforms from the US to build combat capabilities, but these systems, and most of those inherited from the Warsaw Pact era navy, are ageing. Today, Poland's navy operates three submarines (including two *Kobben* class diesel-electric attack submarines from a purchase of an original four from Norway), two frigates, eight amphibious landing ships, a handful of coastal patrol and MCM vessels, and a number of logistics and support ships.<sup>83</sup> However, nearly half the fleet is expected to become obsolete in the coming years.<sup>84</sup>

Poland has thus recently begun to prioritise naval investments and is actively seeking to modernise its fleet with new procurements of surface and submarine vessels to enter service in the late 2020s. However, debates within national security circles on the size and composition of the future fleet are ongoing; a previous modernisation programme which was to purchase seven *Gawron* class corvettes was cancelled in 2012.<sup>85</sup>

Poland's National Security Bureau has published a concept that advocates tackling sea blindness

<sup>81</sup> Federal Ministry of Defence (Germany), *Konzeption der Bundeswehr* (Bundeswehr Concept) (Berlin: Federal Ministry of Defence, 2018), 58, 41.

<sup>82</sup> Authors' translation. Andreas Krause, "Wir Brauchen mehr Macher in der Marine! (We need more makers in the Navy!)" *MarineForum* 3-2019: 7.

<sup>83</sup> International Institute for Strategic Studies, *The Military Balance*, 136.

<sup>84</sup> Frank G. Hoffman, *Assessing Baltic Sea Regional Maritime Security* (Philadelphia: Foreign Policy Research Institute, 2017), 18.

<sup>85</sup> Radio Poland, "Tusk terminates 'senseless' warship project," Radio Poland, 24 February 2012, <http://www.thenews.pl/1/9/Artykul/91311,Tusk-terminates-%E2%80%9Ccsenseless%E2%80%9D-warship-project>.

and the land-centric culture in the Polish military-political domain, highlighting the primary missions of the Polish Navy as the protection of the homeland, the collective defence of NATO and the strengthening of deterrence, with a heavy focus on countering Russia in the Baltic Sea; but also arguing for the Navy to have a global role.<sup>86</sup> For these tasks, it is suggested that:

The current forces of the Polish Navy are not adequate to the level of threats, challenges, and opportunities generated by the country's maritime security environment, its goals, and the maritime area of operations. Responding to major threats generated by Russia in the Baltic Sea area is not possible with the use of present potential and with the forces claimed in the agreed Navy Modernization Program.<sup>87</sup>

Comparing Poland's size and wealth to that of other states, the concept outlines an ambitious goal to transform the Polish Navy into a post-modern, medium-sized global force projection navy, and sets out an impressive shopping list of capabilities to achieve this.<sup>88</sup>

## A.4 FINLAND AND SWEDEN

Finland and Sweden – two of the three non-NATO states that border the Baltic Sea – cooperate very closely with the Alliance as enhanced opportunities partners and are members of the EU. Because of their geography, these two states play a vital role in maritime security, defence and deterrence in the Baltic Sea.

### A.4.1 FINLAND

For Finland, Baltic Sea maritime security is necessary to provide for the continuous functioning of society in times of crisis, for ensuring Finland's territorial integrity, and for permitting the lawful uses of the sea. Its most recent maritime posture and capability development priorities are outlined in the defence policy guidelines contained in the Government's Defence Report of 2017.<sup>89</sup>

<sup>86</sup> National Security Bureau (Poland), *Poland's Strategic Concept for Maritime Security* (Unofficial translation by the Polish Naval Academy) (Warszawa/Gdynia: National Security Bureau, 2017), 22, 37.

<sup>87</sup> Ibid, 31.

<sup>88</sup> Ibid, 51-52, 56-57.

<sup>89</sup> Prime Minister's Office (Finland), *Government's Defence Report*. Prime Minister's Office Publications 7/2017 (Helsinki: Prime Minister's Office, 2017), 22-23.

Defence in the maritime domain is focused on the integrity of Finland's territorial waters, security of vital SLOCs, and an ability to repel, with the support of the air force and land forces, attacks from the sea. This requires: a year-round long-endurance presence at sea; a high level of MSA; effective command and control; an ability to strike targets at sea, both from the coast and from seaborne platforms; and an ability to deny approaches to the coast through the use of sea-mines. AAW and ASW capabilities are also regarded as important in executing the tasks of the Finnish Navy. The Finns have a very limited aspiration to project naval power beyond their shores and archipelago – mainly in the form of a possible contribution to international crisis management operations once the Squadron 2020 project (see below) has been completed.

Finland's key strategic partners in the maritime domain are Sweden and the United States. Cooperation adds to Finland's capability to exercise sea control in the northern part of the Baltic Sea, to deter acts of aggression, and also to secure greater access to some critical technologies. It is unlikely, however, that in the event of a larger-scale security crisis, the Finnish Navy would shift its attention further south in the Baltic Sea. In peacetime, the Finnish Navy directs only limited attention to tasks such as the protection of vital undersea infrastructure – a policy area yet to be addressed properly by the Finnish authorities.

As with all Finnish defence developments, the upgrading of the Navy is being undertaken as part of Finland's highly interconnected, joint and inter-agency system, and within a comprehensive national security framework. The Navy's current inventory includes eight guided-missile patrol boats, five minelayers, three MCM vessels, and land-based mobile missile launchers armed with *RBS15* coastal anti-ship missiles. The strategic project 'Squadron 2020' envisages the retirement of four older *Rauma* class guided missile patrol boats and two *Hämeenmaa* class minelayers, and the building and bringing into service of four multi-purpose corvettes. These corvettes are regarded as more survivable and more capable platforms, well-suited for the operating environment in the Baltic Sea.<sup>90</sup> The project also includes the procurement of a new and more capable anti-ship missile ('Surface-to-

<sup>90</sup> Ministry of Defence (Finland), "Squadron 2020."

Surface Missile 2020') and modernisation of the minelayers.

#### A.4.2 SWEDEN

In common with many Western states, Sweden retired or reduced many higher-end capabilities in the post-Cold War period and focused the Swedish Armed Forces on crisis response operations. Today, Sweden is working to regenerate at least some of those capabilities, including in the maritime domain. It is also focusing more on the Nordic-Baltic area as a key priority.

In response to an environment characterised by hybrid threats and the threat of the use of conventional military force, Sweden is concentrating its attention on enhancing MSA, ensuring 24/7 readiness, providing forces for persistent presence at sea, and enhancing cooperation between military and constabulary forces. Rejuvenating capabilities such as ASW has also received a new impetus. The Swedish Royal Navy is clearly being re-configured, and its posture refashioned, for an extended spectrum of missions that also includes high-end warfighting. This requires a high level of situational awareness, high readiness and highly survivable capabilities to deny an adversary quick gains or uncontested control of the sea.

Like the Finnish Navy, the Swedish Royal Navy places great emphasis on maintaining the sovereignty and territorial integrity of Sweden, with a particular focus on ensuring security of the territorial waters and the Swedish islands in the Baltic Sea (including the strategically important Gotland). Protecting vital SLOCs is also a critical consideration – especially those leading to the port of Gothenburg which, as Sweden's primary North Sea facing port, would play a vital role in implementing Sweden's host nation support agreement with NATO in the event of a crisis. This agreement would probably require extra effort from Sweden in protecting Allied convoys in the last stage of their journey to this port. Sweden's naval perspective and planning thus has to include not just the Baltic Sea, but also the approaches to the Baltic from the North Sea.

Sweden's current priorities for naval capability development are set out by the parliament in a defence bill covering the period of 2016-2020;

a special defence commission is the midst of preparing a report that will lay the basis for the next period of 2021-2025.<sup>91</sup> According to this bill, Sweden has sought to maintain a core capability consisting of five *Visby* class corvettes, two submarines (*Gotland* and *Södermanland* class), seven MCM vessels (five *Koster* class mine-clearance vessels, and two *Spårö* class mine clearance diver vessels) and an amphibious battalion. Two *Gävle* class corvettes and two *Gotland* class submarines were to receive mid-life upgrades, and seven patrol boats were to have their service lives extended. To reinforce ASW capability, four patrol boats were to be refitted as sonobuoy vessels and two *Stockholm* class corvettes to be refitted as patrol boats. Procurement of new anti-ship missiles, light torpedoes and a signals intelligence vessel, and the construction of two additional submarines were also initiated during this period. A naval version of the Helicopter 14 system (for ASW and other roles) became operational.<sup>92</sup>

Swedish naval cooperation priorities include deepening the bilateral cooperation with Finland and the US as well as with a number of other Baltic Sea states such as Germany and Denmark. Since 2017, it has also been part of the UK-led Joint Expeditionary Force. This international involvement helps to maintain a particular emphasis on interoperability in naval capabilities with key partners. Political constraints, however, limit what Sweden can do in cooperation with NATO in the maritime domain, for example in sharing surveillance data.

<sup>91</sup> Government Offices of Sweden, "The Swedish Defence Bill 2016-2020," Government Offices of Sweden, 24 April 2015, <https://www.government.se/government-policy/defence/the-swedish-defence-bill-2016-2020/>.

<sup>92</sup> Government Offices of Sweden, "Sweden's Defence Policy 2016 to 2020," Government Offices of Sweden, 2 June 2015, <https://www.government.se/information-material/2015/06/swedens-defence-policy-2016-to-2020/>.

## ANNEX B. AN INTRODUCTION TO MARITIME SECURITY

The maritime domain is both a busy international commons and a complex military operating environment. It may be characterised by the slow physical movement of civilian, government and military ships on its expansive surface and unseen cables and pipes crossing the seabed. But its threats, which originate from the sea, air and land, are diverse and in some ways – in that they may lurk below the water in the form of sea-mines or submarines – unique.

Since maritime security may require the application of capabilities associated with military armed force, national law policing,

or a combination of the two, interagency cooperation is important. Similarly, since not all states have the capability or capacity to respond to every threat, international cooperation in order to leverage the capability and capacity of other states, be they partners or treaty allies, may also be required to respond to some threats

### B.1 DIMENSIONS OF MARITIME SECURITY

A convenient model for discussing the range of activities required to respond to maritime threats is Sloggett's seven dimensions of maritime security: state-on-state, terrorism, smuggling, trade protection, resource management, responding to disasters, and oceanography.<sup>93</sup> Table B-1 lists the broad capabilities required to respond within each these dimensions.

Dimension	Maritime Capability	Dimension	Maritime Capability
<b>State-on-State</b>	Project Naval Power beyond EEZ	<b>Trade Protection:</b>	Maritime Interdiction Operations (VBSS)
	Defend Seaward Maritime Airspace		Maritime Search and Rescue
	Defend Seaward Maritime Surface		Anti-Piracy Operations
	Defend Seaward Maritime Subsurface		Maritime and Coastal Law Enforcement
	Defend Coastline		Vessel Management
	Defend Critical Infrastructure		Port/Container Security
	Defend Maritime Facilities		Navigation Aid Management
	Defend Internal Waters	<b>Resource Management:</b>	Fishing Management/Law Enforcement
	Challenge EEZ/TTW Encroachment		Resource Management/Enforcement
<b>Terrorism</b>	Anti-Terrorism Interdiction Operations		Pollution Prevention/Mitigation
	Anti-Terrorism Law Enforcement		Coastal Facility Management
	Critical Infrastructure Protection	<b>Smuggling</b>	Anti-Smuggling Interdiction Operations
<b>Oceanography</b>	Ocean Bottom Mapping		Anti-Smuggling Law Enforcement
	Bathymetry	<b>Disasters</b>	Maritime Search and Rescue
	Meteorology/Tides/Currents		Civilian Evacuation
	Pollution Monitoring		Humanitarian Assistance

**Table B-1. Maritime Security Capability to Dimension Matrix (after Sloggett)**

<sup>93</sup> Dave Sloggett, *The Anarchic Sea* (London: C. Hurst and Co., 2013), 36-39.



In most states, these capabilities are divided amongst traditional naval forces, constabulary forces such as coast guards and border guards, and administrations that deal with economic, safety, administrative, and scientific functions. Different states organise these sea services in different and frequently unique ways. The responsible agencies are also often administered by different ministries (for example: defence, interior, finance) requiring close interagency cooperation and definitive legal authorities in order to ensure they work together to ensure a state's maritime security and are able to cooperate internationally to respond to threats that may straddle specific areas of geographic (within or outside national waters) or dimensional (hybrid, grey-zone threats) responsibility.

Maritime security agencies, be they naval or other, must thus be provided with the proper national legal authorities required for the varied roles they may fulfil through the continuum of peace, crisis, and war. They need to be able to recognise where they are in this continuum and be able to respond appropriately, with processes and procedures to rapidly activate the proper responses with the required authorities when the situation changes. This requires close interagency cooperation, a common operating picture, pre-planned responses and rapid decision making at the military political level. Thus, in addition to maritime situational awareness, an operations centre capable of recognising the threat and directing action, pre-planned disaster response plans, and legal authorities are key enabling activities for effective maritime security (Table 2).

<b>Enabling Activities</b>	Maritime Situational Awareness	Disaster/Threat Response Plan
	Maritime or Joint Information and Operations Centre	Legal Authorities

**Table B-2. Enabling Activities for Maritime Security**

## B.2 ADMINISTRATIVE FUNCTIONS AND CAPABILITIES

Administrative activities include ocean bottom mapping, bathymetry, meteorology, the calculation of tides and currents, and pollution monitoring. Oceanography is notionally an

administrative function, which supports naval warfare by creating an understanding of the conditions and risks of the operating environment. While normally conducted by research vessels, other maritime vessels or UUVs can be equipped to gather data to be synthesised ashore. Ocean bottom mapping also supports the naval role of mine hunting, while maps developed in the course of mine hunting can be shared for scientific purposes. Resources and analysis provided by international governmental or commercial partners may satisfy the needs of a small state in this dimension.

Other trade protection and resource management administrative capabilities such as maintenance of navigation aids, vessel management and traffic safety, and coastal facility management normally fall under an agency such as a maritime administration in the ministry of finance.

## B.3 CONSTABULARY FUNCTIONS AND CAPABILITIES

Functions normally considered constabulary include: trade protection, resource management, smuggling, and responding to maritime disasters. The capabilities required to execute these functions for a large maritime law enforcement agency is a mix of vessels of varying sizes from port security boats to large cutters that enhance MSA, police the legal use of the seas, and board or interdict potential violators. MSA and SAR capabilities are enhanced by both fixed- and rotary-wing MPA.

A mix of small harbour security boats and larger patrol boats are required to provide these law enforcement functions and monitor operating patterns in internal and coastal waters. The larger patrol boats are required to operate farther from shore in more adverse weather and sea-state conditions to police sea lines of communication. They must also be able to conduct maritime interdiction operations by approaching and hailing vessels at sea and deploying visit, board, search and seizure (VBSS) teams to interrogate potential law breakers, conduct safety inspections, assist disabled vessels, stop illegal fishermen, or interdict smugglers and terrorists. Patrol boats and VBSS teams should be appropriately armed and trained to respond to the threats they may encounter.

At a minimum, helicopters are required for SAR at sea. SAR requires highly trained personnel who are regularly exercised to ensure that these complex, risky operations are completed as safely as possible. These aircraft also contribute to MSA and can help spot pollution, illegal activity and other threats to trade or the abuse of national resources. Their aircrews should be equipped and trained appropriately.

#### B.4 MILITARY FUNCTIONS AND CAPABILITIES: THE ROLE OF LARGE AND COASTAL NAVAL FORCES

Functions normally considered military are protection from state-on-state threats and terrorism, but constabulary forces may also be required to contribute to the latter during peacetime and the former during wartime. Naval forces focus on the protection of the state by defending against military threats posed by the armed forces of another state, terrorism, and protection of SLOCs in their EEZs. Navies may also respond to threats that would normally be categorised in other dimensions of maritime security, but because of the nature of the perpetrator (a state actor) or the location of the threat (outside territorial waters) would normally be beyond the jurisdiction of constabulary forces or their capability to respond effectively. These actions include ensuring the safe passage of vessels destined for or departing a state's ports, stopping those that may have contraband or hazardous cargo, and monitoring vessels in transit through their international waters.

Larger navies may be equipped and manned to project naval power far from their own shores. Naval activities are organised into warfare disciplines that power projection navies could bring to bear against the littoral of another coastal state.<sup>94</sup> These disciplines include:

- ASuW to engage and if necessary destroy hostile surface vessels;
- ASW to locate, impede and destroy hostile submarines;

- strike warfare to project naval power ashore with large diameter guns, missiles, or attack aircraft from aircraft carriers;
- AAW to defend naval forces from military aircraft or missile attacks originating from air, land or sea based systems;
- amphibious warfare to land armed forces and mechanised equipment that would conduct armed warfare activities on the ground; and
- mine warfare to lay mines defensively or offensively, and to clear mines to restore access to mined or potentially mined areas.

Naval ships and submarines also conduct ISR operations to monitor the naval and littoral environment visually and electronically via radar and sonar and by monitoring the electromagnetic signals used by militaries, governments and civilians to communicate. They may also have defensive and offensive EW and cyber capabilities to monitor the spectrum of communications and active sensors, protect their own systems and disrupt the C4ISR networks of adversaries.

Coastal navies protect and control the state's maritime natural resources, defend against and repel violations of its territorial waters, and defend against an invasion from the sea with both intra- and inter-state cooperation.<sup>95</sup> They also need the capabilities to respond with armed force to security threats in the other dimensions of maritime security where constabulary maritime forces are either not capable or not authorised to do so. Typical tasks include protecting harbours that during peacetime may be secured by contracted civilian water-borne guards; securing critical infrastructure that is normally protected by similar peacetime means; maritime interdiction operations, VBSS, maritime SAR in a non-permissive wartime environment; and ensuring that maritime border patrols are armed and trained appropriately.

<sup>94</sup> Littoral: the area from the sea near the coast to inland from the coast that can be influenced from the sea. Department of Defense (US), *DoD Dictionary of Military and Associated Terms* (Washington DC: DoD, 2019), 142.

<sup>95</sup> Jacob Boressen, "Coastal Power: The Sea Power of the Coastal State and the Management of Maritime Resources," in *Navies in Northern Waters 1721-2000*, ed. Rolf Hobson and Tom Kristiansen (Abingdon and New York: Frank Cass, 2004), 255.

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