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Security at sea, cyber space, and the governance of the global commons

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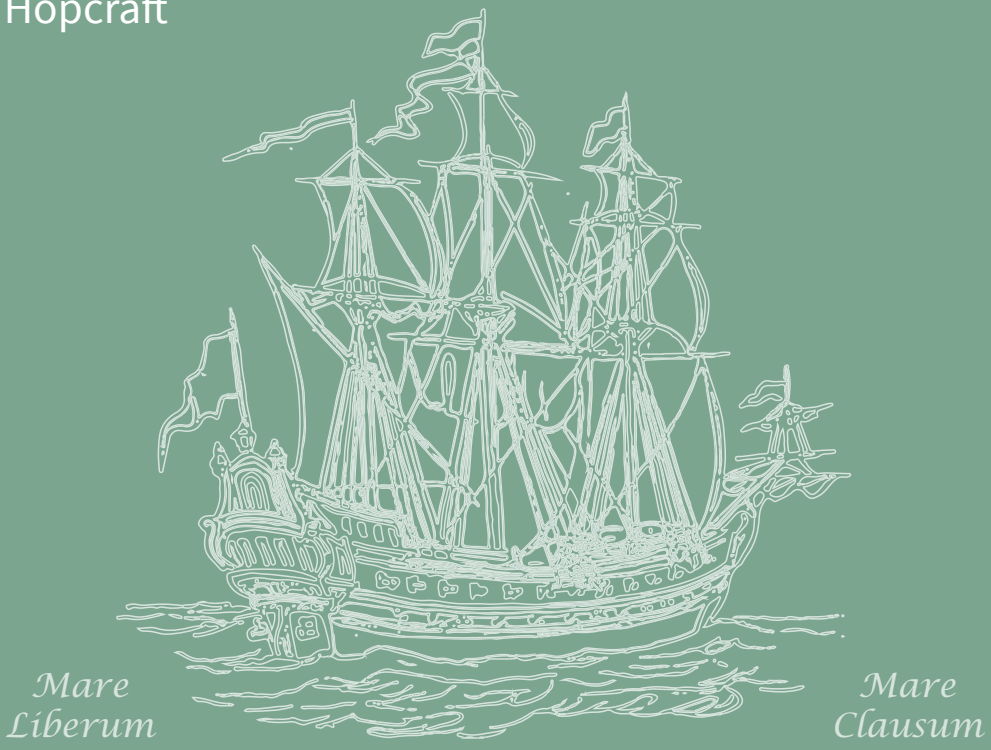

Hindsight Perspectives for a Safer World
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About the Hindsight Perspectives reports series

Hindsight Perspectives for a Safer World is a collaboration between History & Policy at King's College London and Lloyd's Register Foundation. We work with professional historians researching maritime topics to provide historical context and insight to contemporary maritime safety challenges. The goal of the project is to deepen understanding of these issues and provoke creative solutions in an era of huge technological and organisational change for the industry. Working with the materials in Lloyd's Register Foundation Heritage and Education Centre (HEC) as well as wider sources, historians produce Hindsight Reports within the scope of the challenges of the Lloyd's Register Foundation.

About the author

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Executive summary

- This paper examines the development of maritime governance across centuries, exploring how this has shaped the approach of the international community to the management of modern risks in the maritime sector today, and the implications for the nascent challenge of cybersecurity.
- The paper highlights the concept of the sea as a 'global commons', an idea that dates back to at least the seventeenth century and Hugo Grotius' Mare Liberum.
- From an early stage, modern thinking on the sea as a commons has been underpinned by commercial and political interests.
- During the nineteenth century, British policymakers attempted to cultivate international law at sea through multilateral conferences as well as state practice, in order to bolster neutral rights and safeguard the British Empire and its vast merchant marine. However, the First World War demonstrated Britain's continued willingness to close the seas when it deemed it necessary in order to secure its national and imperial interests.
- The war fuelled an international effort to devise a collective security organisation to reduce the prospect of future conflicts, which would also maintain freedom of the seas, as set out in the second of President Woodrow Wilson's 'Fourteen Points'. Yet the League of Nations did not emerge as an effective arbiter on questions of security, and the Second World War broke out two decades later.
- In the meantime, greater success was found in international approaches to the issue of safety at sea during the first half of the twentieth century. These collaborations, through effective international arbitrage, saw maritime safety become a focal point for the commons. The International Convention for the Safety of Life at Sea (SOLAS), and lesser-known International Convention on Load Lines, demonstrated the effectiveness of the co-operation between the commercial and political elements within the commons.
- The Second World War acted as a catalyst for the formation of new supra-national organisations, giving rise to the United Nations in 1945, which was intended to manage questions of sovereignty and security. Under the purview of the UN, the creation of the International Maritime Consultative Organization (IMCO) was a pivotal moment in the governance of the maritime commons. IMCO provided a forum through which maritime affairs could be discussed, and regulatory updates (particularly those around SOLAS) could be enacted.
- These early efforts were followed by the development of the United Nations Convention on the Law of the Sea (UNCLOS), which provided the legal framework for simplifying the delineation of the maritime space, including the codification of the maritime commons (areas beyond national jurisdiction, or 'The Area').

- However, these post-1945 initiatives were also limited in comparison to earlier ideas concerning international organisation. The IMO, as IMCO became, functions primarily as an information exchange and place for collaboration in the context of the commons. Its mechanisms allow for non-state actors to provide information and influence policy, which can be both a critical source of information and stakeholder involvement, and also potentially problematic as these are vested commercial interests. The degree of involvement of commercial interest in the body responsible for managing international regulation is unusually high in the maritime sector as compared to other industries.

- The IMO, like many other agencies, also has inherent problems including limited enforcement abilities. Thus, it relies upon and fosters overlapping mechanisms of rules and guidelines which are difficult to change and possible to manipulate.

- The historical process of developing mechanisms for governing the sea as a commons provides a useful lens through which to consider challenges in the global commons today, especially those relating to cyber security. The management of new risks challenging the safety and security of the commons does not need a radical new approach, rather a reflection on the past and a continued gentle adaptation of mechanisms to ensure the equilibrium between freedom and competition within the commons.

- There is no international body to oversee the governance of cyber space, so the IMO should consider its role in governing both the maritime space and cyber space.

- Given the unique challenges concerning cyber security in the maritime sector – or maritime cyber security – this paper calls for a focus on the sub-concept of a 'maritime cyber commons', building on long-standing practices of governing the sea as a global commons, and combining these areas conceptually to address emerging challenges in the 21st century.

Given the unique challenges concerning cyber security in the maritime sector... this paper calls for a focus on the sub-concept of a 'maritime cyber commons'

Introduction

This paper analyses a broad sweep of efforts to develop international law relating to the use of the sea as a global commons in peace and war since the 17th century, both in terms of the state and security, and of safety and the shipping industry. While early efforts centred on state practice and multilateral conferences, the 20th century saw a turn to international organisation. We explain that, although attempts to craft an international apparatus for security at sea proved to be largely ineffective, the effort to cultivate international law concerning safety at sea was more successful, culminating in the creation of the Safety of Life at Sea Convention. Thereafter, a useful international fora was established for this purpose, namely the International Maritime Organization, as well as the United Nations Convention on the Law of the Sea which codifies and builds upon the practice of nations balancing the rights and jurisdiction of flag states and coastal states.

This paper analyses a broad sweep of efforts to develop international law relating to the use of the sea as a global commons in peace and war since the 17th century

We analyse these major developments relating to security and safety at sea historically in order to provide a helpful mirror for policymakers and practitioners today addressing the future of governing the global commons of the sea, and the new commons of cyber space. This is particularly important given the specific threats posed from the latter domain in the former domain, namely the threat of cyber attacks in the shipping industry. We encourage conceptualising these overlapping areas as a ‘maritime cyber commons’, and encourage decision makers to embrace the variety of forms of international co-operation to enhance both safety and security in the global commons, building on the historic successes outlined here.

The sea as the global commons – who benefits?

The idea of the sea as a shared space has a long history. In the 17th century, the Dutch lawyer Hugo Grotius famously set out the concept of the 'free sea' in *Mare Liberum*, published in 1609. The right of navigation meant that all could use the sea, including for the purposes of trade, under their rights in the law of nations. This was a legal argument with global ramifications, offending elites in England and Scotland as well as Portugal and Spain. In response, the Scottish jurist William Welwod argued in favour of exclusive rights in territorial waters, especially fisheries[1]. The English crown similarly sought to lay claim to parts of the sea by establishing England's dominion over the Channel, set out in John Selden's work *Mare Clausum*[2]. Yet Grotius' purpose was less enlightened than is sometimes imagined. He wrote the work anonymously for the Dutch East India Company, staking its claim in the European imperial competition. While promoting the concept of a free sea appeared to be an attempt to shape a more co-operative and liberal basis in understandings of international law, the Dutch East India Company viewed trade as a zero-sum game[3].

Ultimately, early steps toward the development of international law at sea in the 17th century were dominated by efforts to undermine notions of the sea as a global commons and a space for co-operation between states. The ideological claims of *mare clausum* and *mare liberum* underpinned the burgeoning Anglo-Dutch trade rivalry, which tellingly would be settled through conflict. England's emergence as the

Naval battle near Ter Heijde on 10 August 1653, during the First Anglo-Dutch War. Artist Jan Abrahamsz Beerstraaten. The war was a naval conflict between the Commonwealth of England and Dutch Republic largely caused by disputes over trade. Public domain, via Wikimedia Commons.

1 Hugo Grotius, *The Free Sea*, trans. Richard Hakluyt, ed. by David Armitage (Indianapolis: Liberty Fund, 2004), p. xi-xviii.

2 John Selden, *Mare Clausum, Seu De Dominio Maris* (London: William Du-Gard, 1652).

3 Gijs Rommelse and Roger Downing, 'The fleet as an ideological pillar of Dutch radical republicanism, 1650-1672', *The International Journal of Maritime History* 27:3 (2015), p. 401.

dominant naval power was supported by the Navigation Acts (1651, 1660), as well as the cultivation of the fiscal-naval state and the creation of the Bank of England in 1694[4]. Having turned the Royal Navy into the most potent force on the world's oceans, British leaders ensured that their well protected merchant marine enjoyed a similar position of dominance in the world's carrying trade. More broadly, while the seas would be free in time of peace for all nations to trade, Britain reserved the right for the Royal Navy to close the seas when it deemed necessary, despite uproar from other states[5].

Nevertheless, by the end of the Napoleonic Wars in 1815, the British Empire had emerged as the world's pre-eminent great power and sought to develop a vision of the sea as the global commons for worldwide trade, a decision underpinned by the repeal of the Corn Laws in 1846. By the end of the 19th century, the importance of the sea as a global commons, free for all to use, was being recognised and highlighted by prominent maritime strategic thinkers. Most notable of these was Alfred Thayer Mahan, an American naval officer who published the influential book *The Influence of Sea Power Upon History* in 1890. Mahan explained to his readers that the sea was 'a great highway… a wide common, over which men may pass in all directions'[6]. It was 'the great means of communication between nations'[7], and 'the common birthright of all people'[8]. However, Mahan understood the limits to this. The sea remained a space of naval and maritime competition, rather than purely co-operation and trade. He elaborated that 'by controlling the great common, [a navy] closes the highways by which commerce moves to and from the enemy's shores'[9].

4 Andrew Lambert, *Seapower States: Maritime Culture, Continental Empires, and the Conflict that Made the Modern World* (New Haven: Yale University Press, 2018), pp. 190-1, 272-7.

5 Stephen Conway, 'Economics, Warfare, and the Sea, c. 1650-1945', in David Morgan-Owen and Louis Halewood, eds., *Economic Warfare and the Sea: Grand Strategies for Maritime Powers, 1650-1945* (Liverpool: Liverpool University Press), p. 24-36.

6 Alfred Thayer Mahan, *The Influence of Sea Power Upon History* (Boston: Little, Brown, and Company, 1890), p. 25.
See also: Sam J. Tangredi, 'The Maritime Commons and Military Power', in Scott Jasper and Scott Moreland, eds., *Conflict and Cooperation in the Global Commons* (Washington, D.C.: Georgetown University Press, 2012), p. 74.

7 Alfred Thayer Mahan, 'The Future in Relation to American Naval Power', *Harper's New Monthly Magazine* 91:545 (1895), p. 770.

8 Mahan, *The Influence of Sea Power Upon History*, p. 42.

9 Mahan, *The Influence of Sea Power Upon History*, p. 138.

The 19th century – national and international routes to governance

By the middle of the 19th century, many of the great powers of Europe increasingly came to view aspects of economic warfare as problematic. At the end of the Crimean War, they attempted to address the issues of the operation of blockade, as well as privateering, deemed to be state-sanctioned piracy. The result was the Declaration of Paris of 1856, codifying a new understanding of international law which governed the rules for war at sea, and especially neutral rights[10]. Privateering (private ships issued with letters of marque from the state that permitted them to attack enemy shipping) was made illegal, while restrictions were placed on the use of blockade, specifically that neutral goods could not be captured unless they were deemed contraband, and that a blockade had to be effective at sea for it to be legally binding. Building on this effort to codify the rules governing the use of the sea, the second half of the 19th century saw Britain attempt to lead the way in cultivating international law. British leaders recognised that 'economic warfare brought together the sea as a legal and strategic space' and sought to use their naval supremacy to undergird a more modern understanding of international law[11].

the Declaration of Paris of 1856... codified a new understanding of international law which governed the rules for war at sea, and especially neutral rights

British leaders pursued a policy of neutrality during these decades, including during the American Civil War (1861-1865). They believed that this would serve to secure British interests, and the British Empire more broadly, not least because Britain possessed the world's largest merchant marine. It seemingly had little to gain from war, and much to lose, so sought to safeguard against this by developing the rights of neutral states at sea. However, unlike the Declaration of Paris, state practice – rather than multilateral conferences – was the primary means for doing this. It proved largely effective, with other states respecting British legislation[12].

Yet new conflicts at the end of the 19th century raised new questions over neutral rights. The great powers convened at The Hague in 1899 for a new conference on the rules of war. New regulations were established concerning humanitarian medical intervention at sea, but the First Hague Conference was unsuccessful in codifying new rules concerning economic warfare, which remained the key concern. In the aftermath of the Russo-Japanese War, the Second Hague Conference was held in 1907 to tackle this issue directly. Some progress was made, most significantly the decision to create an International Prize Court to oversee disputes between belligerents and private entities of neutral states, with Britain and Germany producing a joint draft on this on 21st September 1907. However, the rules concerning economic warfare remained unclear[13].

10 Maartje Abbenhuis, 'Neutrality at Sea in a Global Age, 1815-1914', in David Morgan-Owen and Louis Halewood, eds., *Economic Warfare and the Sea: Grand Strategies for Maritime Powers, 1650-1945* (Liverpool: Liverpool University Press), p. 161.

11 Gabriella Frei, *Great Britain, International Law, and Maritime Strategic Thought* (Oxford; Oxford University Press, 2020), pp. 17-8, 24. See also: Scott Andrew Keefer, '"An Obstacle, Though Not a Barrier": The Role of International Law in Security Planning during the Pax Britannica', *International History Review* 35:5 (2013), p. 1031-51.

12 Frei, *Great Britain*, pp. 43-83.

13 Frei, *Great Britain*, pp. 133-5; Abbenhuis, 'Neutrality at Sea', pp. 164-7.

The recently-elected Liberal government in Britain – which had sought to bolster neutral rights by pressing for the immunity of private property at sea in 1907 – sought to solve the matter with a further conference held in London over the winter of 1908-09[14]. Notably, the Netherlands was invited due to the decision that the international prize court would be located at The Hague. The result of the conference was the Declaration of London of 1911, which defined the rules governing economic warfare at sea with greater clarity, enhancing neutral rights. Despite controversy in parliament, the British delegation was content, declaring that the new rules safeguarded neutral rights as well as legitimate belligerent rights[15].

Picture taken during the Second Peace Conference at The Hague in 1907. Participants of the conference are sitting in a meeting in the Ridderzaal (Hall of Knights) in The Hague. Public domain, via Wikimedia Commons. Anonymous unknown author, CC BY-SA 3.

14 Andrew Lambert, *The British Way of War: Julian Corbett and the Battle for a National Strategy* (New Haven: Yale University Press, 2021), pp. 203-12.

15 Frei, *Great Britain*, pp. 138-9, 148.

Maritime safety on the agenda

In sum, the period between 1856 and 1914 saw significant gains made in terms of developing international law at sea, in favour of the expansion of neutral rights in the global commons. Yet these efforts toward international agreement also expanded beyond inter-state security and questions of naval warfare. Indeed, efforts to regulate the use of the commons extended to the wider safety and health of seafarers engaged in trade and the maritime industry more broadly. Over the period there were several Royal Commissions that investigated the large losses of life at sea, both from disease and illness as well as from vessel losses. One of the most significant issues was the question of freeboard, which concerned the prevention of overloading ships and consequently risking the vessel and crew at sea. Lloyd's Register of British & Foreign Shipping (later known as 'Lloyd's Register') had recorded the 'load line' of ships since the 1770s, which marked the depth to which a ship could be submerged safely under load.

...efforts to regulate the use of the commons extended to the wider safety and health of seafarers engaged in trade and the maritime industry more broadly

The 'Lloyd's Rule' was subsequently established by the marine classification society in 1835 as a guide to where to place these lines, but it was not until a half a century later that a push for legislation on this issue was made[16]. The Member of Parliament for Derby, Samuel Plimsoll, advocated for safety at sea, with a particular concern for the dangerous overloading of ships. He explained that 'half our losses for nine years… were owing to unseaworthy and overloaded ships', and argued for a Royal Commission to investigate the problem[17]. He was successful after years of campaigning, with the Merchant Shipping Act of 1876 being passed by Parliament. This recommended visible markings on ships to prevent overloading, which became known as 'Plimsoll lines' – though this was not immediately enforced[18].

Lloyd's Register introduced compulsory load lines for awning deck vessels from 1874 and their ongoing research strengthened Plimsoll's campaign. This was used for the Merchant Shipping (Load Line) Act, 1890. Three authorities were allowed to assign load lines under the Act, Lloyd's Register, Germanischer Lloyd (GL), and Bureau Veritas (BV). The Board of Trade's eventual application of load line rules followed the Merchant Shipping (Load Line) Act, 1890. This impacted international understandings of the load line issue due to Britain's domination of the world's carrying trade. As confirmed in the subsequent Merchant Shipping Act, 1894, the Board of Trade was permitted to recognise load lines issued to ships by foreign authorities where it deemed them equivalent to British regulations, and ensured recognition of British-flagged ships by those authorities in turn[19]. Ultimately, British state practice proved influential in the cultivation of international law concerning safety at sea, much as it had from an earlier period with security at sea, during the late 19th century.

16 Nicolaos L. Charalambous, 'Load lines of merchant ships: historical review 1774-1966', (MSc dissertation, World Maritime University, 1986), pp. 8-13

17 Samuel Plimsoll, *Our Seamen: An Appeal* (London: Virtue & Co., 1873), pp. 47-54.

18 David Bosco, *The Poseidon Project: The Struggle to Govern the World's Oceans* (Oxford: Oxford University Press, 2022), p. 57.

19 Merchant Shipping Act 1894 (https://www.legislation.gov.uk/ukpga/Vict/57-58/60/contents/enacted). See also: Charalambous, 'Load lines', pp. 23-37.

However, in the early 20th century the German Marine Association, a governmental organisation working with GL, began to diverge from these standards, and by 1906 it was clear that mutual recognition between the British and German authorities was no longer possible. As with the questions over naval warfare at this time, a solution was sought via a conference, held in Hamburg in 1907. Unlike the Second Hague Conference being held in the neighbouring Netherlands, this was a bilateral conference, conducted between the British and German governments. Lloyd's Register was kept informed of developments directly by the Board of Trade[20]. However, these talks were seen as merely a first step, with the British government intending to approach other states after reaching an agreement with Germany[21]. Hopes for a multilateral conference prompted the creation of the Load Line Committee in London in 1913. The committee was appointed by Sydney Buxton, the President of the Board of Trade, chaired by the naval architect Sir Philip Watts, the former Director of Naval Construction, and included representatives of Lloyd's Register[22]. Yet the work of the committee was hindered by the outbreak of the First World War in 1914, and no international conference would be held on the matter for more than a decade.

The work on load line was not the only initiative to improve safety at sea undertaken by Buxton. Following the sinking of RMS *Titanic* on 14 April 1912, he requested that Lord Loreburn establish an inquiry, which resulted in the first Safety of Life at Sea (SOLAS) convention in 1914. The international agreement, signed by 13 states, famously ensured that ships would carry adequate numbers of lifeboats. It also saw an agreement for international co-operation over the destruction of derelicts (any unrecoverable property on navigable waters) and monitoring of ice in the North Atlantic, funded by the signatories and carried out by the US, along with a range of improvements to ship design and a commitment to radiotelegraphy on board ships[23].

In sum, by the eve of the First World War the sea was viewed by the great powers, as well as non-state actors, as a commons for co-operation as much as competition. Despite the traditional focus in the existing literature on the naval arms races of this period – not least that between Britain and Germany in the North Sea – a considerable amount of time and effort was dedicated to regulating the use of the sea, even between these rival states. The concept of the global commons was in the forefront of the cultivation of international law more broadly, inspiring enhanced co-operation between states, and the bolstering of mutual security as well as safety at sea. However, the machinery for this was ad-hoc and its effectiveness was dubious, alternating between policy activity at the nation state level (particularly in Britain) which effectively set standards for the international community, and formal international collaboration in the form of conferences. The outbreak of war between the great powers of Europe in 1914 would put elements of all these agreements to the test, especially the Declaration of London of 1911.

20 Lloyd's Register Archives (LRA), Committee Minute Book 1907-08, p. 232.

21 Hansard HL Deb 24 June 1907 vol 176 cc847.

22 Hansard HC Deb 2 June 1913 vol 53 cc574-5.

23 LRA, Box 03-02-03, 'Text of the Convention for the Safety of Life at Sea' (1914).

The First World War and the attempt to construct a maritime world order

At first, the efforts to cultivate international agreements prior to 1914 appeared to be surprisingly successful when it came to the test of war, especially given that the House of Lords had prevented ratification of the Declaration of London in Britain, and an international prize court never was established. Although Britain and the United States would controversially stretch their interpretations of international law concerning economic warfare and neutrality, the British government nevertheless sought to adhere to the Declaration of London during the opening months of the war. However, after Germany began its campaign of submarine warfare in 1915 – which flagrantly breached international law – Britain took an increasingly hard line[24]. Facing increasing pressure, the Minister of Blockade, Lord Robert Cecil, opted to abandon the Declaration of London in 1916 in order to tighten Britain's control of maritime trade and increase the damage dealt to the economies of the Central Powers[25]. One of the powers which had lobbied most extensively for restrictions to preserve the commons prior to the war now seemed prepared to openly violate it in order to exploit the power of the blockade.

Yet Cecil had a greater vision for the future of international law and the security of states. Recognising that the pre-war efforts to regulate war at sea had collapsed under the pressures of actual conflict – including the hopes of creating an international prize court – he began to develop his designs for an international organisation which would be dedicated to maintaining international law and enforcing peace. This project would come to be known as the League of Nations[26]. Fundamental to British designs for the League was the role of international naval co-operation, with the victorious states using sea power to enforce peace, primarily through the use of blockade[27]. Sir Julian Stafford Corbett, the maritime theorist who served on the Phillimore Committee which developed the Foreign Office's blueprint for the League, wrote in 1918 that 'the force of an oecumenical sea interdict has become perhaps the most potent of all sanctions'[28]. These ideas served as the foundation of what would evolve into the modern conception of sanctions[29]. Paradoxically, exercising force in the global commons was viewed as the surest path to peace and stability in the international system. Part 1 of the Treaty of Versailles was signed on 28 June 1919 laying the foundation for the League, which became effective from 10 January 1920 with 42 founding members. However, the League as imagined failed to come to pass, in part because the United States Senate would not ratify the Treaty. Collective security would remain a mirage following the First World War.

24 John Ferris, 'Pragmatic hegemony and British economic warfare, 1900-1918: preparations and practice', in Greg Kennedy, ed., *Britain's War at Sea, 1914-1918: The war they thought and the war they fought* (Abingdon: Routledge, 2016), pp. 87-109; Isabel V. Hull, *A Scrap of Paper: Breaking and Making International Law during the Great War* (Ithaca: Cornell University Press, 2014), pp. 183-91; Jan Martin Lemnitzer, 'Woodrow Wilson's Neutrality, the Freedom of the Seas, and the Myth of the "Civil War Precedents"', *Diplomacy & Statecraft* 27:4 (2016), pp. 615-638.

25 TNA, FO 899/3, 'Declaration of London', memorandum by Lord Robert Cecil, 7th June 1916. See also: Marjorie Milbank Farrar, *Conflict and Compromise: The Strategy, Politics and Diplomacy of the French Blockade, 1914-1918* (The Hague: Martinus Nijhoff, 1974), pp. 36-8; Avram Lytton, 'Starvation or Privation? British assessment of blockade before and during the First World War' (Ph.D. dissertation, King's College London, 2019), p. 201.

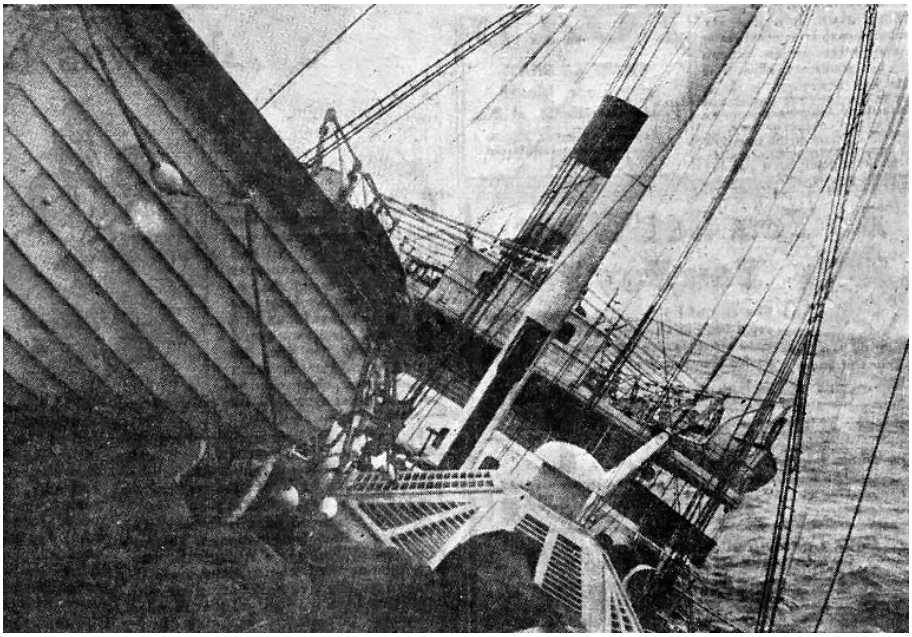
26 TNA, CAB 24/10, 'Memorandum on Proposals for Diminishing the Occasion of Future Wars', Lord Robert Cecil, September 1916.

27 Louis Halewood, 'Peace throughout the oceans and seas of the world: British maritime strategic thought and world order, 1892-1919', *Historical Research* 94:265 (2021), pp. 570-7. See also: Louis Halewood, 'Internationalising Sea Power: Ideas of World Order and the Maintenance of Peace, 1890-1919' (DPhil thesis, University of Oxford, 2019).

28 Julian S. Corbett, *The League of Nations and Freedom of the Seas* (London: Oxford University Press, 1918), p. 10.

29 Nicholas Mulder, *The Economic Weapon: The Rise of Sanctions as a Tool of Modern War* (New Haven: Yale University Press, 2022).

The question of safety at sea, however, was addressed more effectively during the 1920s and 1930s, prompted in part by high profile disasters and large losses of life. A key example was the inquiries and investigations into the sinking of the steam ocean liner *Vestris* in November 1928, which highlighted issues with decision making, crew training, overloading of the vessel, problems with lifeboats, and lack of radio equipment in cargo vessels. Once again, the British government convened a conference on safety at sea in London[30]. The result was the 1929 International Convention for Safety of Life at Sea (successor to the 1914 SOLAS agreement), signed by the governments of Australia, Belgium, Britain, Canada, Denmark, Finland, France, Germany, India, the Irish Free State, Spain, Sweden, the US, and the USSR. The new measures focused on the watertight subdivision of ships and lifesaving appliances, while radiotelegraphy and the American-led North Atlantic ice patrol were revisited, along with alterations to the international regulations designed to prevent collisions at sea. There was even provision for further conferences after five years in order to ensure that the convention could be revised as necessary based on experience[31]. Arthur K Kuhn, a noted American international lawyer, reflected that 'As the commerce of the high seas is international, so also must its regulation be international' – co-operation in the global commons was not optional[32].



On 12 November 1928, the SS *Vestris* sank about 200 miles off Hampton Roads, Virginia resulting in the deaths of more than 100 people. The sinking attracted much press coverage at the time and remains notable for the loss of life, particularly of women and children when the ship was being abandoned. This dramatic picture was taken by a member of the crew, one of the last to take to the lifeboats. Fred Hanson, Public domain, via Wikimedia Commons.

30 Ralph R. Gurley, 'Safety of Life at Sea', *Proceedings* 81:5:627 (1955).

31 LRA, Box 03-02-02, 'International Convention for the Safety of Life at Sea, 1929'.

32 Arthur K. Kuhn, 'The International Convention for Safety of Life at Sea', *The American Journal of International Law* 24:1 (1930), p. 135.

During the 1920s the British Board of Trade sought to convene an international conference to update the accepted load line regulations. In tandem with this, the International Shipping Conference was established in London in 1921, and its meetings during the 1920s served as a forum for encouraging uniform practice by bringing together a range of organisations from different countries. Their work addressed not only issues concerning safety and freeboard, but also economics challenges including trade barriers and double taxation[33]. By 1927 the Board of Trade proposed a new conference, and established a new Load Line Committee, chaired by Sir Charles Sanders, a former civil servant at the Board of Trade, and included James Montgomerie, a naval architect and Chief Ship Surveyor to Lloyd's Register[34]. Its work overlapped with the SOLAS conference, and this event afforded the British committee an opportunity to meet with its counterparts in the US Load Line Committee. By 1929, there was a clear Anglo-American understanding on load lines for ordinary cargo ships, and the British government decided to push ahead with a new International Load Line Conference in 1930. This proved to be an even larger event than the SOLAS conference, with 30 countries represented, along with observers from other countries and the League of Nations. The work at SOLAS proved influential in shaping Britain's administration of the conference, and the result was the successful negotiation of the International Convention Respecting Load Lines. This was a major accomplishment, marking the first multilateral agreement on load lines and certificates, demonstrating the scope for accomplishments with regard to safety at sea[35].

Yet the main organisation devised for cultivating international agreement – the League of Nations – appeared to be heading towards irrelevance even prior to the wider political crises of the 1930s. Discussions over security at sea often took place via other ad-hoc international gatherings, but the results were much less satisfactory for policymakers than those over safety at sea. Short-term success appeared real enough, as naval budgets were cut in an age of austerity and an Anglo-American arms race was averted[36]. Yet this came at the cost of fettering armed liberalism at sea to the benefit of revisionist powers, notably Nazi Germany[37]. The indirect consequence of a lack of stability at sea was another global conflict. The Second World War, like the First World War, was underpinned by naval sea power[38]. However, it also saw the emergence of air power as a devastating strategic tool, underscored by the bombing of Hiroshima and Nagasaki with atomic weapons in 1945. The significance of the sea as a global commons did not necessarily diminish, with the commercial use of the sea remaining just as vital to the global economy, but the influence of naval power had started to wane.

33 United Nations Library & Archives Geneva, League of Nations Secretariat, R2551/9C/3835/1468, H. M. Cleminson to R. Haas, 27th April 1928; Charalambous, 'Load lines', pp. 48-56.

34 Hansard, HC Deb 11th December 1929 vol 233 cc474.

35 'International Convention Respecting Load Lines, 1930', https://www.legislation.gov.uk/ukpga/Geo5/22-23/9/schedule/SECOND/enacted/data.xht?view=snippet&wrap=true. See also: Charalambous, 'Load lines', pp. 57-79.

36 G.H. Bennett, *The Royal Navy in the Age of Austerity 1919-22: Naval and Foreign Policy under Lloyd George* (London: Bloomsbury Academic, 2016).

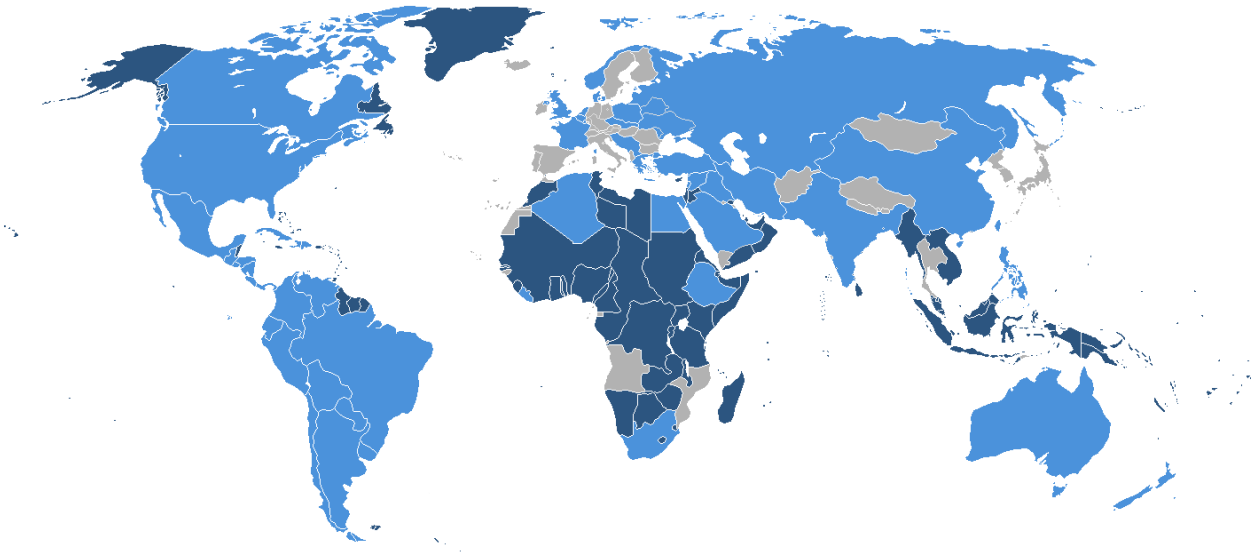
37 John Ferris, ''It is our business in the navy to command the seas': The last decade of British maritime supremacy, 1919-1929', in Keith Neilson and Greg Kennedy, eds., *Far Flung Lines: Studies in Imperial Defence in Honour of Donald Mackenzie Schurman* (Abingdon: Routledge, 1977), p. 155.

38 Phillips Payson O'Brien, *How the War Was Won: Air-Sea Power and Allied Victory in World War II* (Cambridge: Cambridge University Press, 2015).

International governance and the sea after the Second World War

At the end of the Second World War a new organisation for governing the world, the United Nations (UN), was created. Its Charter, signed on 26 June 1945, declared that the organisation set out:

> to save succeeding generations from the scourge or war, which twice in our life-time has brought untold sorrow to mankind… establish conditions under which justice and respect for the obligations arising from treaties and other sources of international law can be maintained, and to promote social progress and better standards of life in larger freedom[39].



A map of United Nations member states at the end of 1945. Light blue are member states, Dark blue are colonies of member states, grey are non-member states. Clam15 at English Wikipedia, Public domain, via Wikimedia Commons.

As with the League, the UN was conceived as a vehicle for the victorious powers to dominate the international system through a rules-based international order, with the US pursuing global primacy[40]. The UN would foster an open economic order between the 51 original members that joined in 1945, and bring Germany, Italy, and Japan into the system as they were reconstructed by the Allies[41]. Yet as with the League, the UN itself failed to become that vehicle, with the five permanent members of the Security Council – Britain, China, France, the Soviet Union, and the US – soon finding that their aims no longer aligned following the defeat of fascism. The world split between east and west in the ideological struggle between capitalism and communism leading to the Cold War[42].

39 Leland M. Goodrich and Edvard Hambro, *Charter of the United Nations: Commentary and Documents* (2nd ed., London: Stevens & Sons, 1949), p. 87.

40 Stephen Wertheim, *Tomorrow, the World: The Birth of U.S. Global Supremacy* (Cambridge: Harvard University Press, 2020), pp. 146-172.

41 G. John Ikenberry, 'The end of liberal international order?', *International Affairs* 94:1 (2018), p. 7.

42 Odd Arne Westad, *The Cold War: A World History* (London: Penguin, 2017), p. 68.

The result of this split was the creation of new apparatus for collective security, most notably the North Atlantic Treaty Organisation (NATO), which comprised the western states under American leadership. Underpinned by air and sea power, the purpose of NATO was to establish a 'Pax Atlantica', enforcing peace by maintaining the unity of armed western democracies against the threat of the Soviet Union, and providing a channelling mechanism for democracy at home to prevent the risk of war being increased by western decisions[43]. Yet this marked a departure from the visions of the first half of the 20th century for the future of world order, which had seen policymakers attempt to cultivate international law underpinned by an international organisation, with a sanction in order to maintain peace. Security at sea would now rest with a distinct organisation, separate from the formulation of international law. The UN would become the forum for the cultivation of international law.

Initially the UN project appeared disconnected from the question of governing the sea, with no mention of it in its Charter. Yet President Harry S Truman's administration put the question of sovereignty and the sea front and centre when it moved to claim the natural resources of the continental shelf in 1945. Other countries followed suit around the world, notably China, which claimed a large swathe of the South China Sea in 1947. The US government realised its error of making a unilateral claim which seemed to fundamentally alter the understanding of international law at sea[44]. The solution would be a return to international collaboration. The UN's Economics and Social Council convened the United Nations Maritime Conference in Geneva between 19 February and 6 March 1948, with the goal of establishing an organisation to address maritime affairs. The result was the Intergovernmental Maritime Consultative Organization (IMCO), with its headquarters in London, established in 1959[45]. It was charged with providing the 'machinery for co-operation among Governments' for matters relating to 'shipping engaged in international trade', and to encourage the highest standards 'concerning maritime safety and efficiency of navigation'. Its goal was 'to promote the availability of shipping services to the commerce of the world without discrimination'[46]. It would be merely 'consultative and advisory', but its Assembly would 'in the future perform the functions of ad hoc diplomatic conferences on safety of life at sea' and serve 'as the Specialized Agency in the field of shipping'[47]. Once established, IMCO took over the management of the first International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL54). In turn, the UN – with the IMCO as a specialised agency – became more suited as a venue for cultivating international law concerning the preservation of freedom of navigation and safety at sea. It did not have mechanisms for enforcement, however, and organisations such as NATO would maintain the more traditional approach to security at sea.

43 Timothy Andrews Sayle, *Enduring Alliance: A History of NATO and the Postwar Global Order* (Ithaca: Cornell University Press, 2019), pp. 5-7.

44 Bosco, *Poseidon Project,* pp. 91-100.

45 Goodrich and Hambro, *Charter of the United Nations*, p. 341.

46 Convention of the Intergovernmental Maritime Organization, 1948, https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=XII-1&chapter=12&clang=_en.

47 Goodrich and Hambro, *Charter of the United Nations*, p. 342.

In the meantime, regulation and governance around safety at sea continued to progress. A new International Conference on Safety of Life at Sea was held in London in 1948. It was attended by representatives from 30 participating states, including all five permanent members of the UN Security Council, and representatives of the UN itself. The agreement updated the 1929 SOLAS convention across a range of issues, including the construction of ships, life-saving appliances, radiotelegraphy and radiotelephony, and safety of navigation. Reference was made to the new IMCO, though at this stage its role was not fully realised[48]. By 1960 SOLAS was updated through the IMCO in London. In 1960 its coverage expanded to include new technical developments such as nuclear-powered ships, and these updates more broadly demonstrated the viability of the IMCO as the forum for codifying international treaties[49].

This was followed in 1974 by a new convention on safety, spurred by the pace of technological change during the latter half of the 20th century. The conference opened with the IMCO's Secretary-General Chandrika Prasad Srivastava explaining that the task of the IMCO had been to move from ad hoc conferences to the creation of 'a standing machinery for keeping the Convention up to date', though this 'had not been as successful as had been hoped'. In turn, the aim was to devise a new amendment procedure to ensure 'that amendments could be adopted and brought into force speedily but without any encroachment of the sovereign rights of the various States'. Clinton Davis, the United Kingdom's Parliamentary Under-Secretary at the Department of Trade, welcomed this ambition and argued that 'Safety measures had clearly to be accepted by all countries in order to be effective, otherwise they would be utterly meaningless'[50]. The result of the conference in establishing a new SOLAS convention was to cement the IMCO's role as the venue for cultivating international law concerning regulations at sea. Indeed, in the intervening years between the SOLAS conferences, the IMCO had turned to the issue of load line, establishing a new convention in 1966.

48 LRA, Box 03-02-02, 'International Conference on Safety of Life at Sea, 1948'.

49 International Convention for the Safety of Life at Sea (SOLAS), 1960.

50 SOLAS/CONF/SR.1, https://www.imo.org/en/KnowledgeCentre/ConferencesMeetings/Pages/SOLAS-CONF-1974-default.aspx.

Safety progresses – but sovereignty and wider governance questions remain

While IMCO became the forum for discussing safety and regulatory issues, post-Second World War the UN would discuss questions of sovereignty and the sea. The result, following decades of negotiation, would become the United Nations Convention on the Law of the Seas (UNCLOS). The First United Nations Conference on the Law of the Sea (UNCLOS I) was held in April 1958 and resulted in the adoption of four conventions commonly known as the 1958 Geneva Conventions. This was conceived as a way to avoid reservations and allow for a broad number of states to accept some if not all of the requirements[51]. Several key issues were clarified under the conventions, including the previously controversial issue of exploiting the continental shelf's resources[52]. The most significant matter, however, was the effort to define freedom of the seas, deeming the high seas to be 'all parts of the sea that are not included in the territorial sea or the internal waters of a State', which are 'open to all nations'[53]. What constituted the limits to territorial seas was less well-defined[54], prompting the Second United Nations Conference on the Law of the Sea (UNCLOS II) in 1960[55]. Despite 28 meetings, only two resolutions were published, one concerning the UN's provisions of a budget for producing and publishing meeting reports, and the other urging UN agencies to support members who required assistance updating fishing practices due to changes in international law. Any substantive decisions on the topics of the breadth of the territorial sea were effectively deferred to a later date[56].

While IMCO became the forum for discussing safety and regulatory issues, post-Second World War the UN would discuss questions of sovereignty and the sea... the most significant matter... was the effort to define freedom of the seas

In 1964, Malta joined the UN and its first ambassador, Arvid Pardo, swiftly became a leading advocate for international governance of the oceans, rather than leaving its resources subject to a scramble among the world's wealthiest states. His efforts were buttressed by a range of developing states, many of which belonged to the Group of 77 (G77). In the UN, this weight of numbers increasingly mattered, and more states started to join discussions over the future of the seas. In 1967, at the 22nd session of the General Assembly, Pardo delivered a famous speech calling for the regulation of activities on the deep seabed[57]. Pardo's speech proved enormously influential, with a seabed committee formed that year. In 1970, despite early resistance from the US and Soviet Union, UN General Assembly Resolution 2749 (XXV) declared that the areas of

51 Tullio Treves, '1958 Geneva Convention on the law of the Sea' (2008) https://legal.un.org/avl/pdf/ha/gclos/gclos_e.pdf.

52 Bosco, *Poseidon Project*, p. 103-5.

53 Convention on the High Seas, 1958 https://www.legal-tools.org/doc/7b4abc-1/pdf/.

54 United Nations Conference on the Law of the Sea: Convention on the Territorial Sea and the Contiguous Zone (United Nations, 1958).

55 Arthur H. Dean, 'The Second Geneva Conference on the Law of the Sea: The Fight for Freedom of the Seas', *The American Journal of International Law* 54:4 (1960), pp. 751-789.

56 United Nations, 1960, Document A/CONF.19/L.15 – Final Act of the Second United Nations Conference on the Law of the Sea, https://legal.un.org/diplomaticconferences/1960_los/docs/english/vol_1/a_conf19_l15.pdf; Office of Legal Affairs, United Nations, 2023, Second United Nations Conference on the Law of the Sea, https://legal.un.org/diplomaticconferences/1960_los/.

57 Jean Buttigieg, 'Arvid Pardo – a diplomat with a mission', *Symposia Melitensia* 12 (2016).

seabed, ocean floor, and subsoil beyond the limits of national jurisdiction were the 'common heritage of mankind'[58]. Connecting the issue of resources in the seabed to older questions of governing the seas remained controversial[59]. Nevertheless, the resolution had set out the groundwork for an international framework that allowed the governance of this common space, and set the stage for the Third United Nations Conference on the Law of the Sea (UNCLOS III) in December 1973.

The conference took place against the backdrop of the *Torrey Canyon* oil spill in 1967, which had proven to be the world's most significant oil spill to that point. As a result, there was a growing desire to govern both resources and the freedom of navigation to protect the fate of the world's oceans[60]. Even in the midst of the Cold War, Robert Friedheim noted that both the US and Soviet Union recognised that the consensus rule of the treaty system allowed a trade-off between issues, permitting discussions to move forward[61]. Yet negotiating UNCLOS III would not prove easy as the key question of what comprised territorial waters remained contested. Certain coastal states, including China and some Latin American states, argued to extend the reach of their national jurisdiction at sea to 200 nautical miles, contending that freedom of the seas had its roots in colonial exploitation and domination. Meanwhile, the larger maritime powers – namely Britain, France, Japan, the Soviet Union, and the US – attempted to uphold an expansive interpretation of freedom of navigation. The impasse produced almost a decade of negotiations, resulting in compromise in 1982. However, unlike 1958, a single document was produced. The result was a compromise. The maritime powers succeeded in limiting territorial waters to a mere 12 nautical miles, to the benefit of flag states, ensuring provision for international straits which coastal states could not legally prevent passage through. This was crucial for the maritime powers, ensuring that they could continue to project their navies globally. In return, coastal states were afforded new 'Exclusive Economic Zones' (EEZ) of up to 200 nautical miles, helping developed and developing countries gain concessions on fishery control and seabed mining as a result. This left some ambiguity as to what could be considered 'high seas', but broadly ensured the protection of freedom of navigation in the commons while defining the limits of sovereign jurisdiction[62]. Thus, Pardo's conception of common heritage for mankind inadvertently opened the way for states to exploit the commons under the guise of acting in the interests of all mankind[63].

58 A/RES/2749(XXV) – Declaration of Principles Governing the Sea-Bed and the Ocean Floor and the Subsoil thereof, beyond the Limits of National Jurisdiction, 1970, United Nations, https://documents.un.org/api/symbol/access?j=NR035014&t=pdf.

59 Bosco, *Poseidon Project*, pp. 121-2.

60 United Nations, *A Quiet Revolution*, p. 3.

61 Robert L. Friedheim, *Negotiating the New Ocean Regime* (Columbia: University of South Carolina Press, 1993), p. 33.

62 Bosco, *Poseidon Project*, pp. 123-33; Christopher C. Joyner and Elizabeth A. Martell, 'Looking back to see ahead: UNCLOS III and lessons for global commons law', *Ocean Development & International Law* 27:1-2 (1996), pp. 73-95.

63 Buttigieg, 'Arvid Pardo', p. 23.

21st century governance - overlapping frameworks and multi-level actors

Officially entering into force on 16 November 1994, UNCLOS provides the legal order for the seas which facilitates international co-operation[64]. The requirements of UNCLOS codified many of the elements of the social contract which surround the core ideas of freedom of the seas. For example, Article 197 stipulates that states must co-operate at a global level to govern their actions and ensure those freedoms for all, including the Freedom to Navigate (Article 87). The result was an internationally-agreed set of rules that govern behaviours within the commons, and an organisation such as the International Maritime Organization (IMO, renamed from IMCO in 1982) charged with overseeing those rules. The text provides clear definitions of when a state can take action against another, arguing that actions outside of this would be unlawful and could be considered a sign of aggression. On the whole, the application of UNCLOS has been a qualified success, with even the US – which famously failed to ratify the treaty – nevertheless abiding by it. In terms of governing the sea, UNCLOS provides zones in which states can exercise their sovereignty and, when that is challenged, a mechanism through which to solve disputes peacefully. The delineation of the maritime space comprising 'The Area' – which lies beyond national jurisdiction – has ensured the continued recognition of much of the sea as being a global commons for all to use.

Nevertheless, this still represents a compromise, raising several concerns over the role of jurisdiction within the maritime commons. Firstly, it allows states to define an Exclusive Economic Zone (EEZ), which effectively allows them to partition resources within parts of the maritime commons, going against the fundamental principle of preserving this for the good of mankind. Secondly, while providing clearly defined boundaries to the sovereignty of global states, the delineation of the space creates its own disputes. For example, China has developed artificial islands in the South China Sea as a way to exploit the territorial waters and EEZ limits within UNCLOS, both to increase its sovereign reach and increase resource exploitation[65].

Constructed between 2014 and 2017, Fiery Cross reef is one of China's seven artificial islands in the Spratly Islands and represents a continued military presence in the region. SkySat, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons.

64 United Nations Convention on the Law of the Sea, 1982 (https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf).

65 Yi-Hsuan Chen, 'South China Sea Tension on Fire: China's Recent Moves on Building Artificial Islands in Troubled Waters and Their Implications on Maritime Law', *Maritime Safety and Security Law Journal*, 1:1-15 (2015).

Furthermore, although UNCLOS provides the legal framework for the creation of specialised agencies like the IMO, it does not provide these agencies with adequate mechanisms to ensure effective oversight and enforcement[66]. This lack of enforcement is compounded by the delineation of sovereignty over the maritime space, whereby these agencies have no jurisdiction over matters within territorial waters, blunting their effectiveness from the outset.

Despite this, much work has been undertaken to provide an apparatus for governing the global commons. Article 219 of UNCLOS refers to applicable international rules and standards to the seaworthiness of vessels, and the IMO has taken this as its guiding principle[67]. It defines its mission today as the promotion of safe, secure, environmentally sound, efficient, and sustainable shipping through co-operation[68]. This weaves into the UN's long-standing assertion that, as an organisation, it is the steward of the global commons, acting on behalf of the international community to protect them through a global governance approach, involving multi-actor perspectives from local, national, regional, and global levels[69]. UNCLOS itself provides the requirement for collaboration beyond just state members (Articles 47 and 48). These non-state actors include Inter-Governmental Organisations (IGOs) and Non-Governmental Organisations (NGOs). To date there are 66 IGOs and 88 NGOs that are officially recognised as observers at the IMO[70]. These organisations are representative of non-sovereign interests, and some comprise commercial users of the maritime commons, for example fishing or deep-sea mining[71]. To become a member of the IMO each non-state member must demonstrate a certain level of expertise in maritime affairs and have the ability and intention to promote and disseminate the principles and work of the IMO[72]. Thus, the IMO fosters a collaborative approach that ensures all maritime stakeholders can play a part in the continued safety and security of the maritime space.

In turn, much of the work completed by the IMO in the facilitation of the protection of the global commons is through acting as a forum for information exchange. It is through this exchange that peaceful solutions to disputes can be sought. While the original mechanisms were set out in the IMCO Convention, the process for negotiations and compromise marks a distinct move by the international community to co-operate and collaborate, rather than purely compete, to ensure the continued safety and security of the global commons. The focus of the IMO on safety has proven largely successful, carrying on the legacy of early safety-focused conventions like the International Convention on Load Lines and SOLAS, which remain

66 Nico Schrijver, 'Managing the global commons: common good or common sink?', *Third World Quarterly* 37:7 (2016), pp. 1252-67.

67 International Maritime Organization, LEG/MISC.8 - Implication of the United Nations Convention on the Law of the Sea for the International Maritime Organization, 2014.

68 International Maritime Organization, Strategic Plan for the Organization, 2023, https://www.imo.org/en/About/Strategy/Pages/Default.aspx.

69 United Nations, Global Governance and Governance of the Global Commons in the Global Partnership for Development Beyond 2015 (2013), https://www.un.org/en/development/desa/policy/untaskteam_undf/thinkpieces/24_thinkpiece_global_governance.pdf; United Nations, Vienna; Klaus Dingwerth and Philipp Pattberg, Philipp, Global Governance as a Perspective on World Politics, *Global Governance* 12:2 (2006), pp. 185-203.

70 International Maritime Organization, *Membership* (2023), https://www.imo.org/en/About/Membership/Pages/Default.aspx.

71 Isabel Feichtner and Surabhi Ranganathan, 'International Law and Economic Exploitation in the Global Commons: Introduction', *European Journal of International Law* 30:2 (2019).

72 International Maritime Organization, Guidelines for Consultative Status (2019).

active today in their updated form. Moreover, both of these conventions require the engagement with not just states, but non-state actors in their implementation and enforcement. Therefore, it is in the interests of non-state actors to be involved in governance discussions via the IMO.

The success of this approach was also evident during the rise of the threat presented by piracy in the Gulf of Aden and operating off the Horn of Africa in 2008. UN Resolution 1851 indicated the importance of a communal response to threats to the commons[73]. The resolution called upon members of the IMO to respond collectively, underlining the responsibility of all members of the international community – both state and non-state – to ensure the continued safety and security of the global commons. This collective response resulted in members engaging in kinetic operations through appropriate organisations like NATO as part of Operation Ocean Shield[74]. Other responses from within the IMO focused on safety, including the publication of the commercially-led series of Best Management Practices for deterring piracy[75]. These guidelines provide recommendations to shipping companies for managing the risk of piratical attacks in these regions within the commons[76].

A visit, board, search and seizure team from the guided-missile destroyer USS *Pinckney* (DDG 91) approaches a suspected pirate vessel, December 2011, Gulf of Aden. U.S. Navy photo, Public domain, via Wikimedia Commons.

73 United Nations, United Nations Security Council - S/RES/1851(2008), United Nations, Geneva.

74 NATO, 'Operation Ocean Shield' (2017), https://mc.nato.int/missions/operation-ocean-shield.

75 Full title - BMP5 – Best Management Practices to Deter Piracy and Enhance Maritime Security in the Red Sea, Gulf of Aden, Indian Ocean and Arabian Sea.

76 International Chamber of Shipping, BMP5 – Best Management Practices to Deter Piracy and Enhance Maritime Security in the Red Sea, Gulf of Aden, Indian Ocean and Arabian Sea, 2018, https://www.ics-shipping.org/wp-content/uploads/2020/08/bmp5-hi-res-min.pdf.

Yet there remains work to be done, with the IMO facing challenges in the 21st century. The complexity of issues and involvement of non-state actors has fostered an environment in which knowledge and information are readily-tradeable commodities within supranational governance structures like the IMO[77]. The idea of knowledge being tradeable is hardly a new concept, of course, and non-state actors have long been approached to fill voids in the knowledge of policymakers, not least through the early discussion on load lines undertaken by Lloyd's Register as a non-state actor[78]. The importance of this expertise remains evident to this day with the Baltic and International Maritime Council (BIMCO) acting as an influential association representing commercial interests and the publication of their cyber security guidelines[79]. The IMO regularly acknowledges the expertise of BIMCO and others like the International Association of Classification Societies (IACS) (including members such as Lloyd's Register), and draws on their position and expertise within the maritime sector enhancing regulatory discussions. Within their own guidelines on maritime cyber security the IMO put forward the BIMCO guidelines as recommended reading for those trying to understand maritime cyber security[80]. Outside of the IMO others like Lloyd's Register Foundation (a global safety charity) and the ENISA (European Union Agency for Cybersecurity) have pooled their expertise and published a range of independent reports on the topic of maritime cyber security. LRF's Foresight Review of Cyber Security for the Industrial Internet of Things highlights the impending threat that cyber attacks pose to critical infrastructure, especially those found within the maritime sector[81].

Yet this reliance upon expert knowledge within maritime governance – which is more pronounced than in many comparable sectors – has been criticised as it has resulted in governance which is overly sympathetic to commercial entities[82]. The complex and often overlapping set of hard governance measures includes laws, rules, regulations, directives, instructions, resolutions, as well as soft measures like guidelines, specifications, standards, and practices[83]. Coupling this plethora of governance mechanisms with the IMO, which actively encourages non-state collaboration, offers clear opportunities for non-state actors to influence the governance of the maritime commons. One such example of this influence is through the submission of documents for discussion during IMO committee meetings. During one Maritime Safety Committee (MSC), which deals with SOLAS today, a total of 148 documents were submitted for discussion. Of the 95 documents submitted by the membership, as opposed to the secretariat, 50 were solely authored by states, 28 were authored by non-states, and 17 were a combined authorship[84]. With 47% of documents including non-state actors, the willingness of non-state actors to spend considerable resources on this demonstrates their interest in influencing the governance of the maritime space.

77 Mai'a K. Davis Cross, 'Rethinking Epistemic Communities Twenty Years Later', *Review of International Studies* 39:1 (2013), pp. 137-60.

78 Peter M, Hauss, 'Introduction: epistemic communities and international policy coordination', *Knowledge, Power, and International Policy Coordination* 46:1 (1992), pp. 1-35.

79 BIMCO, Guidelines on Cyber Security Onboard Ships (2020), https://www.bimco.org/about-us-and-our-members/publications/the-guidelines-on-cyber-security-onboard-ships.

80 See International Maritime Organization, 'MSC-FAL/Circ.3/Rev.2 – Guidelines on Maritime Cyber Risk Management', 2022.

81 Lloyd's Register Foundation, 'Foresight Review of Cyber Security for the Industrial IoT', (2020), https://www.lrfoundation.org.uk/en/news/cybersecurity-foresight-review/.

82 Influence Map, 'Corporate Capture of the International Maritime Organization' (2017), https://influencemap.org/report/Corporate-capture-of-the-IMO-902bf81c05a0591c551f965020623fda.

83 Harilaos N. Psaraftis, 'Maritime safety: To be or not to be proactive', *WMU Journal of Maritime Affairs* 1, pp. 3–16 (2002).

84 See https://docs.imo.org/ for full list of documents and their authors.

Meeting of the Maritime Safety Committee, May 2023. International Maritime Organization, CC BY 2.0 DEED, https://www.flickr.com/photos/imo-un/albums.

While there are checks and balances to limit this influence – for instance, the ability to vote is reserved for member states only – there are some scenarios where this can have a detrimental effect on governance. For example, during the IMO's climate change discussions it has been argued by think tanks and groups such as InfluenceMap and Transparency International that there is clear evidence of financially-motivated commercial groups disproportionately influencing discussion and driving for less stringent regulations to be agreed upon[85]. This is not restricted to non-state actors – a later report by the same group accused states like Japan of using its economic influence to push back against stringent climate policies[86]. Nevertheless, certain non-state actors appear to have proven particularly controversial, and a separate report examining the IMO governance process more broadly concluded that one of the flaws of the organisation is the disproportionate influence of private industry, which at times can be greater than some member states[87]. In evaluating the IMO and the influence of non-state actors, Psaraftis and Konotovas concluded that there are a number of reforms which the IMO could implement in order to control their power and influence within the structures of maritime governance[88]. These reforms include limiting the size and constitution of delegations, and limiting the number of non-state persons representing state members' delegations. They also argued that observers should not be allowed to take the floor, rather relying on the submission of documents co-authored with member states, enabling some control over the influence that non-state actors are able to exert within the governance of the maritime commons.

85 InfluenceMap. 'Corporate Capture of the International Maritime Organization'. (2017), https://influencemap.org/report/Corporate-capture-of-the-IMO-902bf81c05a0591c551f965020623fda.

86 InfluenceMap, 'Decision time for the IMO on climate: The polarized struggle among states for ambitious climate policy on shipping' (2018), https://influencemap.org/report/Decision-time-for-the-IMO-8f253dd1db9a2942b3c4d2d93f39f210.

87 Transparency International, 'Governance at the International Maritime Organization: The case for Reform' (2018), https://www.transparency.org/en/publications/governance-at-the-imo-the-case-for-reform.

88 Harilaos N. Psaraftis and Christos A. Kontovas, 'Influence and transparency at the IMO: the name of the game', *Maritime Economics & Logistics* 22 (2020), pp. 151–172.

A further critique which has been levelled at the IMO and its focus on safety is its limited scope of action in matters of maritime security, which has proven problematic in recent years. In 2014, around the start of the Russian occupation of the Crimean Peninsula, the Ukrainian delegation to the IMO submitted a document raising concerns that the occupation was impacting their ability to meet their maritime safety obligations in the region, notably Vessel Traffic Services[89]. The Russian delegation submitted their own document refuting the Ukrainian claims and argued that, due to Ukraine's supposed inability to maintain these safety obligations, the occupation was justified on the grounds of safeguarding mariners operating within the region[90]. The discussion was ultimately referred to the UN Security Council instead, with the incident illustrating how states such as Russia are willing to exploit cynically the question of safety at sea in order to advance its own interests, in this case the annexation of parts of Ukraine. Moreover, this event revealed the limitations to the IMO's governance of the global commons, with the organisation unable to take effective action due to its lack of effective engagement with matters relating to security, rather than merely safety.

...while UNCLOS and the IMO have been successful in fulfilling certain aspects of their respective roles, these mechanisms are showing signs of age, while deficiencies in their original design... remain

In sum, while UNCLOS and the IMO have been successful in fulfilling certain aspects of their respective roles, these mechanisms are showing signs of age, while deficiencies in their original design, traced through from their earlier 20th century origins, remain. Although they have demonstrated the importance of international law and organisations for fostering co-operation at sea, much like the early Load Lines conventions of the 19th century and SOLAS, they too will need to evolve to confront the emerging challenges of the 21st century. Similarly, the example of the Dutch East India Company illustrates that ideas of a maritime commons have long been connected to the pursuit of private capital. As the UN and its agencies sharpen their focus on environmental protection, sustainability, and cyber security, the significance of non-state actors – as well as reliance on their expertise – may grow too[91]. The increased inclusion and subsequent reliance on non-state actors also underlines the dynamism required to govern the commons. As Jasper and Moreland have argued, 'rising states and nonstate actors have extended their influence and reach dramatically' in the commons, and this necessitates a 'comprehensive approach' with 'national governments, global industries, and international agencies working together in a unified and coherent fashion'[92]. History illuminates how the governance of the maritime commons has fluctuated from a close relationship between state and non-state, to heavily state-focused during both World Wars, and back to the current complex state/non-state relationship. The international

89 International Maritime Organization, 2018, MSC 100/19/5 – Safety and Security of Navigation in the Northern Part of the Black Sea.

90 International Maritime Organization, 2018, MSC 100/19/11 – Comments on Document MSC 100/19/5.

91 Peter J. May, Chris Koski, and Nicholas Stramp, 'Issue Expertise in Policymaking', *Journal of Public Policy* 36:2 (2016), pp. 195-218.

92 Scott Jasper and Scott Moreland, 'Introduction: A Comprehensive Approach', pp. 2-8.

community, through various work within the sector and via the UN, is now positioned so that states look to supranational organisations like the IMO or UN Security Council to tackle the challenges facing the maritime commons. Being mindful of the limitations to these existing mechanisms, the international community can tackle these challenges more effectively by developing international law and organisation accordingly, ensuring continued safety – and enhanced security – in the global commons.

The final section of this paper turns to the emerging challenge of cyber security in the shipping industry in particular. Scholars have increasingly recognised the importance of conceptualising the global commons of not only the sea and cyber space, but air and space, as linked[93]. We contend that the amalgamation of the long-standing maritime commons, with the new cyber commons of the digital age, requires the conception of a 'maritime cyber commons' in which exist unique challenges for maritime industries, which can be addressed in part by updating and improving the existing mechanisms for co-operation in the global commons.

93 Scott Jasper and Scott Moreland, 'Conclusion: Avoiding Conflict and Facilitating Cooperation', in Jasper, ed., *Conflict and Cooperation in the Global Commons*, p. 244.

Safety, security, and lessons for the 'maritime cyber commons'

In 2014, under the MSC's agenda 'Measures to Enhance Maritime Security', maritime cyber security was first discussed. Over the next three years, the topic was discussed both in plenary and amongst specialist working groups. It was then on 16 June 2017 that the IMO ratified Resolution MSC.428(98)[94]. This resolution stipulated that 'cyber risk management', or cyber security, should be included within a ship's existing safety management system (SMS). The development and maintenance of a SMS is mandated for all vessels in order to comply with SOLAS. Yet as with all IMO requirements, the IMO lacks the ability to enforce these changes, so relies upon other stakeholders like the classification societies and port state authorities. Just 11 days later, on 27 June, one of the most damaging maritime cyber incidents to date took place. The NotPetya attack, carried out by Russia, hit shipping giant A.P Møller-Mærsk and caused a reported $300 million in losses[95]. Though the primary target was essentially the Ukrainian tax system, Maersk was impacted too. The attack destroyed 55,000 computers and 7,000 servers, taking 76 port terminals offline[96]. Although it did not directly infect vessels, the attack did affect their operation and ability to sail. In turn, it reiterated the importance of adapting existing legislation and mechanisms of governance to address the challenges in the maritime cyber commons.

The NotPetya cyberattack, carried out by Russia, hit shipping giant A.P Møller-Mærsk and caused a reported $300 million in losses in 2017. Llez, CC BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0>, via Wikimedia Commons.

94 International Maritime Organization, 'MSC.428(98) – Maritime Cyber Risk Management in Safety Management Systems', (2017).

95 Digital Guardian, 'The cost of a malware infection? For Maersk, $300 million' (2020), https://digitalguardian.com/blog/cost-malware-infection-maersk-300-million.

96 Ashford, W., 2019, 'NotPetya offers industry-wide lessons, says Maersk tech chief', https://www.computerweekly.com/news/252464773/NotPetya-offers-industry-wide-lessons-says-Maersks-tech-chief; Nettitude, 'NotPetya Ransomware Attack on Maersk – Key Learnings' (2020), https://blog.nettitude.com/cyber-threat-briefing-considerations-for-ship-owners-and-operators.

In line with the IMO's adoption process, Resolution MSC.428(98) officially entered into force on 1 January 2021. The IMO and its members did not spend the intervening years between ratification and entry into force sitting idle. Discussions continued at pace between state and non-state members to ensure that requirements and expectations were universally applicable and did not present an unfair advantage across the commercial sector. Released in mid-2022 in response to the IMO Resolution, IACS adopted two new IACS Unified Requirements on the cyber resilience of ships and their equipment[97]. Through IACS these requirements will become standard for all new build vessels after 2024 classed with member societies. The sheer complexity of the digital and physical infrastructure underpinning the cyber commons, overlapping with a similarly complex maritime commons, has led to challenges in governing this new maritime cyber commons. Yet as this paper has shown, obstacles to the endeavour of governing the maritime commons are not new. While cyber space is a comparatively new area of co-operation and competition, it 'shares many of the same principles as other domains, [and] every effort should be made to incorporate conventions or codes that guide behaviour throughout the commons'[98]. It is now incumbent on policymakers to address these challenges, particularly as technological developments continue at pace, including remote and autonomous operations.

Firstly, the ratification of UNCLOS pre-dates the modern proliferation of digital and connected technologies. Thus, it is no surprise that the text does not consider the governance of the maritime cyber commons. Moreover, as demonstrated by the drawn-out process of cultivating UNCLOS during the latter decades of the 20th century, the possibility of amending the Convention to reflect 21st century developments is highly unlikely. However, this is not to say that the text is worthless with regard to modern technology. Its language 'could provide a useful template for identification of terms, rights, and duties that provide international co-operation while discouraging excessive sovereign government intervention and coercion in cyber space'[99]. NATO, through the publication of the Tallinn Manual, have demonstrated the application of UNCLOS articles, particularly those around piracy, broadcasting, and disguising nationality, to modern uses by expanding the definitions slightly[100]. For example, cyber-enabled technology could be used to facilitate an act of piracy, or obfuscate a vessel's identity, both of which contravene UNCLOS articles. While far from a perfect solution, this offers some hope that UNCLOS will remain relevant to the maritime cyber commons. Moreover, recent developments by the UN to produce a convention that helps govern Biodiversity Beyond National Jurisdiction (BBNJ) demonstrates that new international mechanisms are a possibility[101].

However, like UNCLOS, BBNJ focuses on a defined space – the high seas and 'The Area'. The maritime cyber common is not so easily delineated from other areas within the cyber commons. Much of the infrastructure underpinning the maritime cyber commons is located well beyond the maritime commons. For example,

97 International Association of Classification Societies, 'IACS adopts new requirements on cyber safety', (2022), https://iacs.org.uk/news/iacs-adopts-new-requirements-on-cyber-safety/.

98 Jasper and Moreland, 'Conclusion', p. 238.

99 Jasper and Moreland, 'Conclusion', p. 237.

100 Michael N. Schmitt, ed., Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations (Cambridge: Cambridge University Press, 2017).

101 United Nations, 'Background on Marine Biodiversity of Areas Beyond National Jurisdictions' (2023), https://www.un.org/bbnj/content/background.

modern remote monitoring of ships requires devices on board to send and receive data from a land-based station geographically located hundreds of miles from the sea. Thus, if an incident were to occur in that land-based control centre it could have an impact on the safety of the vessel, and environment within the commons. The sovereign delineations and original compromises of UNCLOS make this situation and jurisdiction more challenging. Consider the same example, but an attack originating in a second state while the vessel is transiting the territorial waters of a third. The IMO has no jurisdiction over the security of the control centre and would be reliant upon the state to ensure adequate cyber security governance measures. Further bilateral agreements between the company's state and the attacker's state would be needed to bring the perpetrator to justice. Therefore, developing an international mechanism that governs just the maritime cyber commons would be of limited use.

This raises the prospect of developing a mechanism to govern the cyber commons more broadly. There have been some attempts to govern the use of and behaviours within the cyber commons. One of the first attempts to govern the cyber commons was the Convention on Cybercrime, better known as the Budapest Convention[102]. Effective from 2004 and signed by 50 states, the convention set out to harmonise national laws regarding cybercrime, enabling more effective collaboration to be fostered in an attempt to improve investigations into cybercrime and the enforcement of cyber laws internationally. More recently, the European Union has developed the Network and Information Systems (NIS) Directive[103]. This Directive outlines the responsibilities of member states concerning the protection of vital systems belonging to essential services, such as ports and other marine infrastructures. Despite regional efforts to govern their cyber commons, there remains a lack of consistent and universally applicable international mechanisms. Yet this is understandable – the development of a mechanism that governs the cyber common as a whole would be a mammoth task, which the UN has no agency capable of managing, all while seeking to keep pace with rapid technological advancements.

This may appear to signal bleak prospects for the future of governing the maritime cyber commons. However, as efforts to govern the sea during the 19th and 20th centuries show, recognising the limitations of what laws and organisations can achieve is key to the steady development of a framework which can help to reduce risk in the maritime cyber commons. Thus, recognising its limitations in terms of expertise, jurisdictional reach and enforcement capabilities, the IMO has sought to develop a complex regime of overlapping governance mechanisms in its attempt to deal with the challenges of governing the maritime cyber commons. For example, to overcome the challenge of state sovereignty covering ports, the IMO has been mindful of the work by the EU's NIS Directive, which does specify ports as essential services and hence are covered under its requirements.

...recognising the limitations of what laws and organisations can achieve is key to the steady development of a framework which can help to reduce risk in the maritime cyber commons

102 European Union, 'Convention on Cybercrime' (2001), https://rm.coe.int/1680081561.

103 European Union, 'Directive 2016/1148 – concerning measures for a high common level of security of network and information systems across the Union.' (2016), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016L1148&rid=1.

Yet in general, the land-based part of the maritime cyber commons is governed at a national or regional level, while the IMO focuses on the areas beyond national jurisdiction in the maritime commons. Furthermore, recognising the technical complexity of maritime devices, the IMO is also actively encouraging the development of technical standards by non-state organisations like the International Organization for Standardization (ISO) to cover the minimum performance requirements of devices. Through consultation with classification societies, as well as the use of certification required to sail, the carriage of these secure devices can be mandated[104]. Furthermore, other operationally-focused organisations like BIMCO have developed guidelines detailing the cyber security practices that should form part of operations[105]. These guidelines have now become synonymous with maritime cyber security, and the IMO provides reference to them in much of its governance documentation covering cyber security. Thus, the IMO is attempting to govern the maritime cyber commons by implementing requirements like MSC.428(98) which is complementary of other mechanisms.

However, this approach of diffuse and overlapping guidance at different levels has limitations. Due to the technicality of the field, cyber security is beyond the scope of IMO expertise. As such, it requires the involvement of a significant number of other stakeholders to be involved in discussions. As with past examples of cultivating international governance, the involvement of expert NGOs is to be welcomed, but caution is required in places. The active encouragement by the UN and other international agencies has emboldened non-state actors, which have demonstrated an increased willingness to influence governance discussions. Moreover, much of the infrastructure underpinning the maritime cyber commons is commercially maintained. Therefore, if those non-state actors withdrew their services or support it could have a serious impact on safety within the maritime commons. A lack of support from the commercial non-state actors will also have a detrimental effect on the uptake of cyber security requirements. Lacking any enforcement capabilities, the IMO is reliant upon states to ratify requirements into national law, making them enforceable. However, if non-state actors have too much influence over governance decisions they can block those requirements from being ratified, which is a particular concern in the development of cyber risk management practices that may cost the commercial sector money. Thus, the UN and its specialised agency, the IMO, should reflect on its reliance upon non-state actors, and where possible consider the influence and impact their involvement has on governance decisions. As was seen with the original UNCLOS discussions and Pardo's speech, governing to protect 'the common heritage of mankind' is not as simple as it may seem.

104 See International Association of Classification Societies Unified Requirement E26 (Cyber resilience of ships) and E27 (Cyber resilience of on-board systems and equipment) - 2022.

105 BIMCO, 'Cybersecurity Guidelines Onboard Ships' (2020).

Conclusion

The publication of *Mare Liberum* in 1609 marked a key moment in the debate over how to govern the maritime commons which remains pertinent in understanding how the seas are governed today. Hugo Grotius' motivations were far from utopian, and as history illustrates, the bid to establish order, security, and safety in the maritime commons has been fraught with challenges, leading to the creation of an uneasy balance of governance mechanisms today. The logic of these mechanisms, developed across centuries, has relied upon the actions of states – both individually in terms of state practice, and together in efforts to codify international law – as well as non-state actors, and more recently agglomerations of supranational organisations.

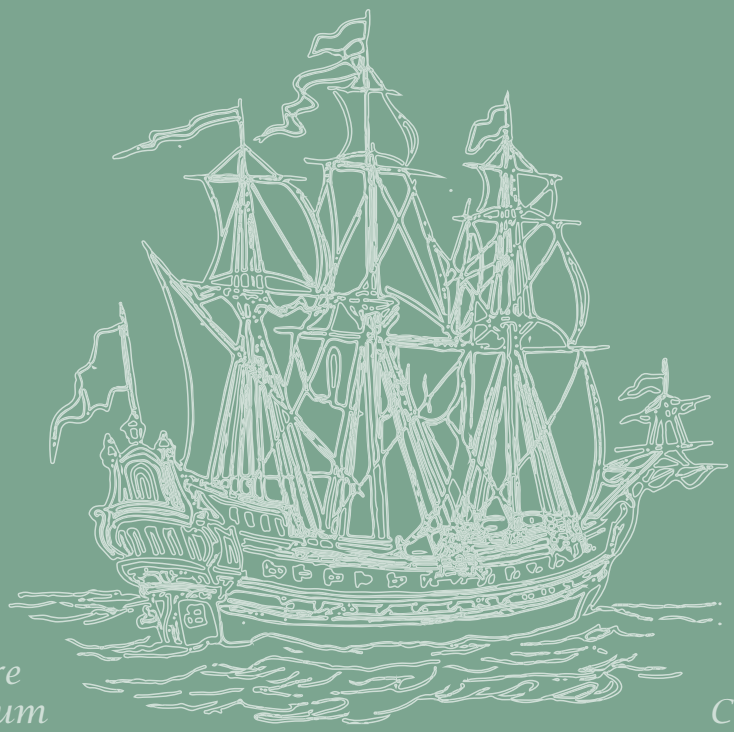
Throughout these centuries, the sea has been a legalistic, commercial, and political space which has been the venue for co-operation as well as competition. At various points, different actors have taken the lead in seeking to establish their vision for how to enhance collaboration at sea and govern the world's oceans, usually in order to bolster their own prosperity and security. For much of the 19th and early 20th centuries Britain, as the world's leading maritime power, supported the idea of a 'free sea' in time of peace, preserving the commercial dominance of the 'British world-system'[106]. However, in war British policymakers reserved the right to use the Royal Navy to close the seas and wield their great strategic tool of blockade. This approach culminated in the League of Nations project at the end of the First World War. Its failure demonstrated the limitations of efforts to bolster security at sea through international organisation.

However, during the 20th century parallel efforts to explore the enhancement of safety at sea through multinational collaboration proved more successful. These also involved non-state actors, such as Lloyd's Register, yet their emphasis on safety largely enabled its advocates to navigate the perils of inter-state competition. The early efforts of SOLAS and Load Lines convention proved a useful foundation for efforts during the Second World War to reimagine projects of international governance. Although the United Nations also proved to be of limited utility in terms of maintaining peace, the advancement of safety at sea through the IMO and UNCLOS during the Cold War has provided a solid basis for continued collaboration in the maritime commons today.

Yet new challenges in the 21st century demand a closer reflection on the varying fortunes of efforts to govern the sea in the past. The emergence of the maritime cyber commons presents challenges for the security of the maritime commons, whereby the safety and security of one relies upon the other. Actors must be wary of being unprepared for governing this new interconnected commons, featuring highly interconnected networks of physical and digital infrastructure. Moreover, the character of cyber security places an increased reliance on non-state actors bringing specialist knowledge to the discussions, while also impacting day-to-day practices within the commons. Furthermore, multi-agency supranational organisations upholding the values of global peace and co-operation within the global commons are now the norm. Thus, governing the maritime cyber commons moves beyond the purview of just the IMO and now is reliant upon these other organisations, again expanding and complicating the governance of the maritime commons, and maritime cyber commons.

106 John Darwin, *The Empire Project: The Rise and Fall of the British World-System, 1830-1970* (Oxford: Oxford University Press, 2009).

Even with the successes of maritime governance mechanisms like UNCLOS, or cyber security mechanisms like the NIS Directive, there are always those who seek to exploit those freedoms for their own advantages. History unfortunately does not provide us a definitive map of managing all risks to the maritime commons, but it does demonstrate the utility of governance mechanisms covering the global commons to adapt to new and emerging risks like cyber security. Managing the new risks challenging the safety and security of this maritime cyber commons does not need a radical new approach, rather a reflection on what has come before, and a continued adaptation ensuring that the balance between freedom and competition remains stable.



Security at sea, cyber space, and the governance of the global commons

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