

# **The Future Maritime Operating Environment and the Role of Naval Power**

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## **Abstract**

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Drawing upon a wide array of primary and secondary sources, this report concludes that maritime issues will be increasingly prominent as the current century unfolds and likely far more so than the last decades of the 20th. Increasing exploitation of marine resources and reliance on the maritime realm to sustain populations and to support socio-economic development are leading to an entwining of ecological stresses and political frictions. Efforts to regulate the ensuing tensions will often become, as they have been, contentious. These developments, which will be further magnified by the shift in power to the Indo-Pacific region (particularly the rise of China and Sino-US competition) as well as many uncertainties regarding the opening of the Arctic region, are underscoring the strategic significance of the ocean space. As a result, naval power will retain its strategic significance. Being an agile instrument of national power in order to deal with security threats and/or to conduct diplomatic and constabulary missions will continue to be the defining requirements of modern navies. While the strategic objectives of seapower remain unchanged, the maritime operating environment will be most likely focussed on the littorals where human social and economic activity is intensifying and state and non-state actors will be operating with increasingly sophisticated capabilities. Modern navies require a broad range of platforms and capabilities to be combat-effective, but the proliferation of such technologies will substantially increase the level of risk to ships and crews, creating additional challenges to many fleets that have already experienced significant reductions.

## **Significance to Defence and Security**

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This report was prepared at the request of the Directorate of Naval Strategy. It is intended to inform future analysis of the environment in which the Royal Canadian Navy (RCN) is likely to operate and to inform the preparation of both future doctrine and concepts. While most naval operations are likely to involve some form of constabulary tasking not involving the use of armed force, the strategic utility of a navy is proportional to its ability to respond across the full spectrum of possible maritime missions: from supporting other government departments (OGDs), to “showing the flag”, to humanitarian aid and disaster relief, to coercive diplomacy and, ultimately, to war. This report underscores the strategic relevance of naval power in a future that will be characterised by maritime considerations that appear to be growing in significance, in terms of socio-economic and political impact. Second, while the subject matter and conclusions are not exclusively Canadian in their focus, they are nonetheless directly relevant to the preparation of assessments of Canada’s maritime strategic interests and the capabilities required to address those interests. Although the report is not specifically about Canada’s interaction with the maritime environment, it highlights issues that will be addressed by both RCN planning and force development.

## Résumé

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En mettant à profit un large éventail de sources primaires et secondaires, le présent rapport permet de conclure que les enjeux maritimes occuperont une place de plus en plus importante au fur et à mesure que nous avançons dans le siècle actuel, et probablement de loin davantage qu'au cours des dernières décennies du XX<sup>e</sup> siècle. L'exploitation croissante des ressources de la mer et la dépendance envers le monde marin pour nourrir des populations et contribuer au développement socioéconomique sont à l'origine d'une situation où stress écologique et frictions politiques s'entrecroisent. Comme par le passé, les efforts visant à régler les tensions qui en découlent susciteront souvent la controverse. Ces rebondissements, amplifiés davantage par le glissement du rapport des forces vers la zone indo-pacifique (notamment l'ascension de la Chine et la rivalité sino-américaine) et par une grande incertitude quant à l'ouverture de la région arctique, mettent en évidence l'importance stratégique de l'espace océanique. Par conséquent, la puissance navale conservera son importance stratégique. La marine moderne sera encore tenue d'être un instrument pratique de la puissance nationale pour faire face aux menaces à la sécurité ou pour effectuer des missions diplomatiques et policières. Certes, les objectifs stratégiques de la puissance maritime demeurent inchangés, mais il est plus probable que le milieu opérationnel maritime soit axé sur les littoraux où l'activité humaine, sociale et économique s'intensifie, et où les acteurs étatiques et non étatiques œuvreront avec des capacités de plus en plus sophistiquées. La marine moderne exige une vaste gamme de plateformes et de capacités pour être efficace au combat, mais la prolifération de telles technologies fera augmenter considérablement le niveau de risque encouru par les équipages et les navires, créant de nouveaux défis pour de nombreuses flottes qui ont déjà été l'objet de réductions importantes.

## Importance pour la défense et la sécurité

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Le présent rapport a été préparé à la demande du Directeur – Stratégie de la Marine. Il vise à guider une analyse future de l'environnement dans lequel la Marine royale canadienne (MRC) poursuivra vraisemblablement ses opérations et à orienter la préparation de la doctrine et des concepts ultérieurs. Certes, la plupart des opérations navales sont susceptibles d'impliquer certaines tâches policières sans le recours aux forces armées, mais l'utilité stratégique d'une marine est proportionnelle à sa capacité à répondre à l'ensemble des missions maritimes possibles : qu'il s'agisse d'appuyer d'autres ministères du gouvernement, d'assurer une présence militaire, d'offrir une aide humanitaire et du secours aux sinistrés ou de pratiquer une diplomatie coercitive pour aboutir à la guerre. Le rapport souligne la pertinence stratégique d'une puissance navale dans un avenir qui sera caractérisé par des préoccupations maritimes qui semblent occuper une place de plus en plus importante sur le plan politique et socioéconomique. Ensuite, même si l'objet du rapport et les conclusions ne visent pas que le Canada, ils touchent néanmoins directement à la préparation des évaluations des intérêts stratégiques maritimes du Canada et des capacités nécessaires pour tenir compte de ces intérêts. Le rapport ne porte pas précisément sur l'interaction du Canada avec le milieu maritime, mais il met en évidence les enjeux dont on tiendra compte dans la planification et le développement des forces de la MRC.

# Table of Contents

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Abstract .....	i
Significance to Defence and Security.....	i
Résumé .....	ii
Importance pour la défense et la sécurité .....	ii
Table of Contents .....	iii
List of Figures .....	v
List of Tables.....	vi
Acknowledgements .....	vii
1   Introduction.....	1
2   The Maritime Environment as a Global Commons .....	5
2.1   The Fisheries .....	6
2.2   Undersea Communications and Minerals.....	9
2.3   Seaborne Trade.....	10
2.4   Regulation of Ocean Space.....	13
3   Challenges to Order in the Maritime Environment.....	15
3.1   Overfishing.....	16
3.2   Submarine Cables .....	21
3.3   Competition for Undersea Resources.....	23
3.4   Seaborne Trade as a Security Issue .....	24
3.4.1   Chokepoints.....	27
3.4.2   Ports as Hubs.....	27
3.4.3   Foreign Flagging .....	28
3.5   Organized Crime and Piracy.....	29
3.6   Regulation and International Competition.....	32
3.7   The Impact of Climate Change.....	35
4   Geopolitical Challenges .....	38
4.1   The Rise of the Indo-Pacific.....	38
4.2   US Decline and Sino-US Competition .....	45
4.2.1   Japan and Taiwan.....	49
4.2.2   The US Strategic Rebalance.....	52
4.3   The Opening of the Arctic .....	55
5   Mitigating the Challenges .....	63
6   The Role of Navies .....	67
6.1   The Constabulary Role, Cooperation and Capacity Building.....	67
6.2   Naval Diplomacy .....	69
6.3   War at Sea.....	71
6.4   Sea Control and Sea Denial.....	73

6.4.1	Submarines .....	74
6.4.2	Sea Mines .....	77
6.5	Littoral Operations.....	79
6.6	The Impact of Technology .....	81
6.7	The Importance of Interoperability.....	85
6.8	Thinking about Attrition.....	86
7	Conclusion .....	90
	References .. .....	93
	Primary Sources .....	93
	Secondary Sources .....	96
	Books, Monographs and Reports.....	96
	Book Chapters, Conference Papers and Journal Articles .....	101
	Newspaper, Magazine and Blog Articles .....	109

## **List of Figures**

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Figure 1: One World Ocean .....	1
Figure 2: Aquaculture and Capture Production (1950–2012). ....	7
Figure 3: Aquaculture and Capture Production by Global Region (1990–2012). ....	8
Figure 4: Global Shipping Density.....	12
Figure 5: Offshore Maritime Zones Recognised under International Law Source.....	14
Figure 6: China’s Relative Contribution to Food Fish Consumption (1970–2008). ....	19
Figure 7: Ocean Space within Exclusive Economic Zones Source.....	33
Figure 8: Maritime Boundary Claims in the South China Sea. ....	34
Figure 9: Major Sea Lines of Communication in Asia.....	42
Figure 10: The First and Second Island Chains.....	47
Figure 11: Plan for “Forward Positioning” following 2012 Strategic Guidance.....	54
Figure 12: The Arctic Region.....	57
Figure 13: Arctic Shipping Routes. ....	58

## **List of Tables**

---

Table 1: World Container Fleet Development, 1990–2016 (in ‘000s TEUs).....	11
Table 2: The Top 10 World Container Ports. ....	12
Table 3: Flags of Registration (top 10 countries by Deadweight Tonnage). ....	28
Table 4: Overview of Major Indo-Pacific Navies and Coast Guards. ....	43
Table 5: Defence Expenditure by US and China (in US\$ billions). ....	49
Table 6: USN and the PLA(N) Compared (2014). ....	49

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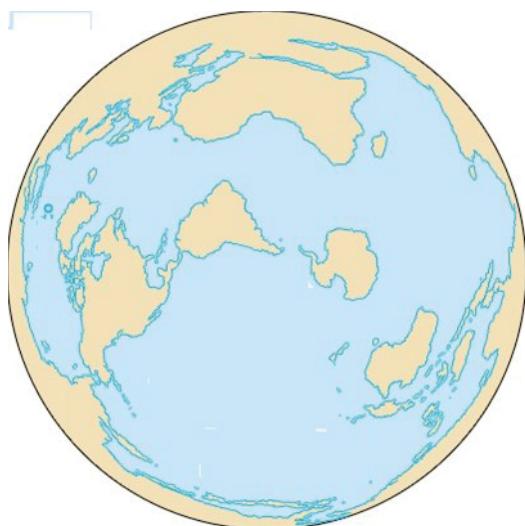
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# 1 Introduction<sup>1</sup>

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The maritime environment is immense. It should not be surprising, therefore, that seawater is the most abundant substance on Earth. Nearly 70 percent of our planet is covered with large bodies of it which are connected to one another to form what can be justly regarded as a single world ocean (see Figure 1).<sup>2</sup> When looked at in all three dimensions, that global ocean comprises 99 percent of the planet's living space and between 50 and 80 percent of all life on this planet is found under its surface.<sup>3</sup> Humanity has always been affected by the oceans. Interaction between land and sea, along with deep sea ocean currents, help determine the world's climate, thereby impacting food supplies and settlement patterns. Global commerce, transportation and communications have developed because of the unique properties of its principal component. Water's relatively high density and low viscosity means that its surface can be easily travelled. Maritime contact and commerce between peoples who did not enjoy a close land connection would have been much more difficult, perhaps prohibitively so, "if seawater were as viscous as molasses."<sup>4</sup> Until the locomotive, and later the airplane, the seas were the fastest means of transportation. And, last, the fact that water in its solid state floats, which is unusual in the natural world,<sup>5</sup> creates formidable maritime hazards and is the defining characteristic of the polar seas.



**Figure 1: One World Ocean.**

Source: Adapted from "Oceano", *Wikipedia* [<http://es.wikipedia.org/wiki/Océano>].

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<sup>1</sup> The cutoff date for data used in preparation of this report is 1 June 2015.

<sup>2</sup> Ian Speller, *Understanding Naval Warfare* (Routledge: London, 2014), p. 17.

<sup>3</sup> See United Nations Educational, Scientific and Cultural Organisation (UNESCO), *World Oceans Day - Facts and Figures* [accessed on 25 February 2015 at [www.unesco.org/new/en/unesco/events/prizes-and-celebrations/celebrations/international-days/world-oceans-day-2014/](http://www.unesco.org/new/en/unesco/events/prizes-and-celebrations/celebrations/international-days/world-oceans-day-2014/)].

<sup>4</sup> Roger Revelle, "The Ocean", *Scientific American*, Vol. 221, No. 3, September 1989, p. 63.

<sup>5</sup> I am grateful to my colleague Chad Young for this observation.

How we relate to the oceans is, to a considerable extent, a function of perspective; and it is important to take note that our views have changed over time. It was only after the Age of Discovery (16<sup>th</sup> to 18<sup>th</sup> centuries) that we began to think of the many seas as *one ocean*.<sup>6</sup> For much of our history, the seas have appeared to be a realm without natural features, save coastlines. In time, we learned that the waters below have bathymetric features, as well as variations of salinity and temperature, that are critical to the development and maintenance of currents. As a result of technology that permits us to plumb the depths, we now know that such characteristics affect our own interaction with the oceans. For much of our history, the oceans were seen as an inexhaustible resource that was beyond our ability to affect in any substantive way, as we have always done with the land. This vision has long influenced how we relate to the maritime space, as when Shakespeare wrote that “my bounty is as boundless as the Sea.”<sup>7</sup> In recent decades, however, environmental science has made us aware of the significant (and frequently devastating) impact our species has on the maritime realm.<sup>8</sup> For much of our history, the oceans have been associated with danger. The sea voyages of early mariners often hugged the shoreline, fearing what lay in the deep-seas beyond the horizon. This is reflected in the warning found on the edge of sea charts that read *hic sunt dracones* (tr. here are dragons) and in the old Breton prayer that begins “Thy Sea, O God, is so great, and my boat so small.”<sup>9</sup> The fear of rough seas will never entirely disappear, although it is now likely accompanied by a scientific curiosity about the interaction of water and weather.

This paper will identify some of the major influences on our use of the oceans today and in the decades comprising the first half of the 21<sup>st</sup> Century. While it does not focus specifically on Canada’s relationship with the maritime realm, it follows publications prepared by the Royal Canadian Navy (RCN), namely *Leadmark: the Navy’s Strategy for 2020* (2001) and *Securing Canada’s Ocean Frontiers* (2005). Like those documents, this paper approaches the maritime realm as an environment in which economic, political *and* military activity occurs. Although its readership is likely to be naval, the discussion that follows includes issues that are not restricted to the role of navies and are not specific to national and/or international security. This is because discussing the maritime environment ought not to be restricted only to the most obvious causes of international conflict. Adopting a broader perspective and describing what that environment might be like in the future is, however, not an easy undertaking. A widely acclaimed report published in 2013 asserts that “[t]he marine world in 2030 will be almost unrecognisable owing to the rise of emerging countries, new consumer classes and resource demand.”<sup>10</sup> This paper must also include, therefore, a review of the use of the ocean space, economic challenges, legal disputes, climate change, as well as new geopolitical considerations (i.e., the rise of the Indo-Pacific, Sino-US strategic competition and the increased interest in the Arctic).

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<sup>6</sup> Revelle, “The Ocean”, p. 61.

<sup>7</sup> William Shakespeare, Act 2, Scene 2, *Romeo and Juliet*.

<sup>8</sup> Marine conservation biologist Callum Roberts writes that “with an ever accelerating tide of human impact, the oceans have changed more in the last thirty years than in all of human history before.” See his *Oceans of Life: The Fate of Man and the Sea* (Penguin Books: New York, 2012), p. 3.

<sup>9</sup> The first verse of the prayer captures the helplessness of Man’s relationship with the overwhelming reaches of the ocean environment: “Thy sea, O God, is so great, And my boat so small. It cannot be that any happy fate, Will me befall. Save as Thy goodness opens paths for me, Through the consuming vastness of the sea.”

<sup>10</sup> Lloyd’s Register Group, Qinetic and the University of Strathclyde, *Global Marine Trends 2030* (London, 2013), p. 6.

Much of the discussion that follows will be about commerce. This is inevitable, for in an increasingly globalised world, seaborne trade is its most visible manifestation and there are more commercial ships plying the world's maritime trade routes and carrying a broader variety of goods than ever before. A recent magazine article calling for greater governance of the high seas observed that five percent of global GDP and 350 million jobs are tied to the use of the oceans.<sup>11</sup> These figures, however rigorously derived, can only be an estimate, because a full accounting of the total economic value (direct and indirect) of the oceans is beyond our ability. Many cities (ports and those inland) are linked in a global network that facilitates the intensification and acceleration of seaborne trade, and their continued affluence and growth depend upon that role. Indeed, many national economies are increasingly dependent upon the oceans<sup>12</sup>—for food, industry, energy, tourism, trade and transportation. Sometimes, though not very often, this fact is noted by political leaders.<sup>13</sup>

Since the oceans will remain central in national and international political and economic considerations, they are and will ultimately be of enormous strategic importance. Consequently, our interaction with the maritime environment must also be “set within a wider framework of human conflict.”<sup>14</sup> The last third of the paper is devoted to the role of navies. This is certainly warranted, because countless major wars and lesser conflicts have had a maritime dimension. Even during the Cold War when open warfare was avoided, the Superpowers relied upon ballistic missile submarines to uphold the system of nuclear deterrence. The role of sea power in international security will therefore continue and countries will need to devote resources to building and maintaining naval forces, particularly as the range of possible missions remains broad. It is generally acknowledged that the littorals will probably be the focus of naval operations in future decades, other forms of armed conflict will also have a maritime dimension.<sup>15</sup> Technology has always influenced and, in our own day, has greatly expanded the range from

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<sup>11</sup> Trevor Manuel, David Miliband, and Jose Maria Figueres, “The High Seas Need Global Governance”, *Sea Technology* (September 2014), p. 7.

<sup>12</sup> For example, one study conducted in 2011 indicated that the dependence of Great Britain on maritime trade will expand during the next two decades, with imports growing by 287 percent and exports by 119 percent. See Alistair Osborne, “Britain’s reliance on sea trade ‘set to soar’”, *The Daily Telegraph*, 12 August 2011.

<sup>13</sup> Canada’s dependence on the sea was acknowledged when Prime Minister Stephen Harper stated that the national economy floats on salt water. Prime Minister of Canada, *PM delivers remarks on the unveiling of the Royal Canadian Navy Monument on Richmond Landing*, 3 May 2012 [accessed on 13 November 2012 at <http://pm.gc.ca/eng/media.asp?id=4781>].

<sup>14</sup> Dave Sloggett, *The Anarchic Sea; Maritime Security in the Twenty-First Century* (C. Hurst and Co.: London, 2013), p. 4.

<sup>15</sup> To choose a recent example: operations in Afghanistan (post-September 2001), many hundreds of miles from any coastline, often included key allies (the US, but also the UK and France) projecting power from the sea. Other coalition members, such as Canada, conducted interdiction operations at sea, cutting the enemy’s supplies, disrupting its financing (via the drug trade and black market oil exports), as well as its seaborne line of retreat. In addition to replenishment missions to allied ships in the Persian Gulf and Arabian Sea, the RCN hauled more than 22,000 vessels and performed more than one-half of all boardings conducted by the anti-terror coalition. See Philippe Lagassé, “Matching Ends and Means in Canadian Defence”, in David Carment, Fen Osler Hampson and Norman Hilmer (eds.), *Canada Among Nations 2004: Setting Priorities Straight* (McGill-Queen’s University Press: Montreal, 2004), pp. 80–81. A survey of naval history noted that “[f]or much of the early part of the [Afghan] campaign (...) air support was almost exclusively provided by US Navy and Marine Corps aviation operating from carrier battle groups in the Gulf.” R. G. Grant, *Battle at Sea; 3,000 Years of Naval Warfare* (Dorling Kindersley: New York, 2011), p. 346.

which naval activities can be coordinated and power projected ashore, changing the scope of sea-based operations. This too will continue to happen. New types of adversaries that frequently use the maritime environment have also emerged, including terrorists and non-state actors (organised crime, human smugglers, and drug cartels), and older ones have returned (pirates). There are, nonetheless, common reference points, for alongside this dynamic the purpose of waging war at sea remains unchanged. Its object, the British strategist Julian Corbett wrote, “must always be directly or indirectly to secure the command of the sea or to prevent the enemy from securing it.”<sup>16</sup>

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<sup>16</sup> Julian S. Corbett, *Some Principles of Maritime Strategy* (Longmans, Green and Co.: London, 1911), p. 87.

## 2 The Maritime Environment as a Global Commons

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In April 2015, the Group of Seven (G7) Foreign Ministers issued a *Declaration on Maritime Security*. It stated that “the maritime domain is a cornerstone of the livelihood of humanity, habitat, resources and transport routes (...) As the world’s population grows, our reliance on the oceans as a highway for commerce and a source of food and resources will increase even more. The free and unimpeded use of the world’s oceans undergirds every nation’s journey into the future.”<sup>17</sup> To a considerable extent, that has always been true. Humanity has depended on access to the oceans for its survival and development. It is for this reason that an estimated 80 percent of the world’s urban areas are within the littorals.<sup>18</sup> In our increasingly globalised world, this interaction is also evident in the use of the seas to access supply and labour markets: today, cotton grown in the US can be shipped to African mills, and then to Asian clothing factories before being returned to the US retail market.<sup>19</sup> The seas are both an important engine of state income (e.g., Suez Canal tolls provide 11 percent of Egypt’s revenue<sup>20</sup>) and a vital artery delivering more than 50 percent of oil, the lifeblood of the global economy.<sup>21</sup> Merchant shipping is no longer as closely aligned with national flags as it once was, but the stake that every country has in a smoothly functioning global maritime trading system has nonetheless grown. It can be argued, therefore, just as the G7 Foreign Minister’s declaration implied, that countries share a common interest in protecting both “manufacturing nodes and resources nodes”, as well as the security of the sea lines of communication (SLOCs) and ports of entry.<sup>22</sup>

Additionally, there is no doubt that many people in societies around the globe today view the maritime environment as a patrimony to be protected and preserved for future generations. That outlook underscores an important difference between how we have traditionally distinguished between the Earth’s land surface and its oceans, where the former is almost completely divided among sovereign states, and the latter has until recently remained largely uncontrolled. The Dutch jurist, Hugo Grotius (1583–1645), called the oceans “an open access, common pool” in his classic treatise, *Mare Liberum* (tr. freedom the seas).<sup>23</sup> It was this distinction that eventually led to the conceptualisation of the ocean space, both the waters and the resources within, as a “common

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<sup>17</sup> G7 Foreign Ministers’ Declaration on Maritime Security, Lubeck, Germany, 15 April 2015, p. 1.

<sup>18</sup> There is no formal agreement on what constitutes a littoral zone. For the purposes of this paper it is defined as “coastal sea areas and that portion of the land which is susceptible to influence or support from the sea, generally recognised as the region which horizontally encompasses the land-watermass interface from 100 kilometres (km) ashore to 200 nautical miles (nm) at sea, and extending vertically into space from the bottom of the ocean and the land surface.” See Chief of the Maritime Staff, *Leadmark: The Navy’s Strategy for 2020* (Ottawa, June 2001), p. 3.

<sup>19</sup> This example is mentioned in James J. Corbett and James Winebrake, *The Impacts of Globalisation on International Maritime Transport Activity*, Paper presented at the Global Forum on Transport and Environment in a Globalising World, 10–12 November 2008, Guadalajara, Mexico, [accessed on 15 September 2014 at [www.oecd.org/greengrowth/greening-transport/41380820.pdf](http://www.oecd.org/greengrowth/greening-transport/41380820.pdf)], p. 7.

<sup>20</sup> Sloggett, *The Anarchic Sea*, p. 50.

<sup>21</sup> See “Quantities and Modes of Transport”, *Black-Tides.com*, no date [accessed on 21 November 2012 at [www.black-tides.com/uk/oil/transport-oil/quantities-modes-transport.php](http://www.black-tides.com/uk/oil/transport-oil/quantities-modes-transport.php)].

<sup>22</sup> This argument is found, for example, in Robert C. Rubel, *Corbett Paper No. 11 - Navies and Economic Prosperity – the New Logic of Sea Power* (King’s College: London, October 2012).

<sup>23</sup> Quoted in Michael Orbach, “Beyond the Freedom of the Seas: Ocean Policy for the Third Millennium”, *Oceanography*, Vol. 16, No. 1, 2003, p. 21.

heritage of mankind”, a phrase first mentioned in international law only in the mid-1950s.<sup>24</sup> As it applies to the oceans, it suggests that all of humankind should share in the riches that the maritime environment contains, and in a way very different from how we relate to the natural resources found on land. The UN’s International Year of the Ocean (1998) subsequently drew attention to the inter-connectedness of human societies and the global maritime environment. In the years since, there have been calls to expand the legal coverage of the ocean spaces, in part to preserve this common heritage. These demands will likely increase as human activity in the ocean seas intensify. Nevertheless, it is because no state fully controls the oceans and are used by all, that we can refer to them as a global commons.<sup>25</sup>

## 2.1 The Fisheries

The first interaction of our species with the maritime environment could well have been through seeking food along the oceans’ coasts or shoals. That activity continues and, today, seafood is a major source of nutrition for the planet’s population, and fisheries provide direct employment to tens of millions of people globally. According to the Food and Agricultural Organisation (FAO), about a billion people worldwide rely on seafood as their main source of animal protein.<sup>26</sup> According to a report from the UN Secretary General, it makes up about 20 percent of the global population’s animal protein intake and the oceans are an irreplaceable source of food for people living in countries where protein intake is low.<sup>27</sup> Seafood is a major component in the production of food on land (e.g., as fertiliser or as livestock feed). Some countries, particularly those bordering the oceans, are very dependent on it: for example, it is estimated that seafood provides up to 80 percent of the diet of those living in the Philippines (approx. 100 million people) and 25 percent of the diet of China’s population (totalling about 1.4 billion).<sup>28</sup> Fishing, therefore, has a large economic footprint in such countries and will continue to do so. But the economic dependence on the fisheries is universal. The FAO stated in 2014 that more than 58 million people are involved in capture fisheries, with 84 percent of them in Asia and about 10 percent in Africa.<sup>29</sup> In China alone, according to one study, approximately 13 million people work directly in the fish industry.<sup>30</sup> In Canada, with one of the most economically valuable fisheries, approximately 80,000 people are employed and there are about 19,000 registered fishing vessels.<sup>31</sup>

The size of the global catch of wild fish has been largely static since about 1990, with the only increase in fish production coming from aquaculture or fish farming (see Figure 2). Much of that is due to the enormous expansion by China in aquaculture. Today, more than 220 species of

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<sup>24</sup> Orbach, “Beyond the Freedom of the Seas: Ocean Policy for the Third Millennium”, p. 24.

<sup>25</sup> A definition of “global commons” can be found on the website of the United Nations Environment Programme [accessed on 6 January 2015 at [www.unep.org/delc/GlobalCommons/tabid/54404](http://www.unep.org/delc/GlobalCommons/tabid/54404)].

<sup>26</sup> Food and Agricultural Organisation (FAO), *Global and regional food consumption patterns and trends* [accessed on 12 December 2014 at [www.fao.org/docrep/005/ac911e/ac911e05.htm](http://www.fao.org/docrep/005/ac911e/ac911e05.htm)], p. 7.

<sup>27</sup> United Nations General Assembly (UNGA), *Oceans and the law of the sea; Report of the Secretary-General*, A/69/71, 21 March 2014, p. 6.

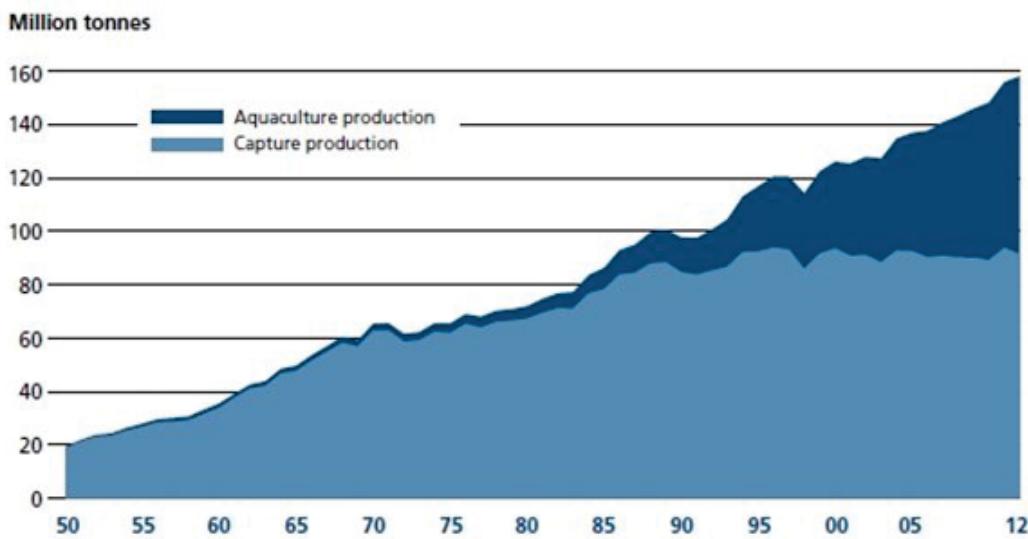
<sup>28</sup> Monika Barthal-Datta, “Food Security in Asia: Challenges, Policies and Implications”, *Adelphi Papers* 441–442 (International Institute of Strategic Studies: London, 2014), p. 120.

<sup>29</sup> FAO, *The State of the World’s Fisheries and Aquaculture* (Rome, 2014), p. 6.

<sup>30</sup> Barthal-Datta, “Food Security in Asia: Challenges, Policies and Implications”, p. 121.

<sup>31</sup> Fisheries and Oceans Canada, *Canada’s Fisheries; Fast Facts 2013* (Ottawa, 2014), pp. 1–2.

finfish and shellfish are farmed.<sup>32</sup> Consequently, fish supply has outpaced world population growth, and by 2013 almost one-half was supplied by fish farming (see Figure 3).<sup>33</sup> Internationally, it is generally accepted that aquaculture will need to continue to play an important role in seafood production. Acknowledging this, the FAO's *Bangkok Declaration and Strategy* (2000) emphasized the need for development of the aquaculture sector to assist “global food availability, domestic food security, economic growth, trade and improved living standards.”<sup>34</sup>



**Figure 2: Aquaculture and Capture Production (1950–2012).**

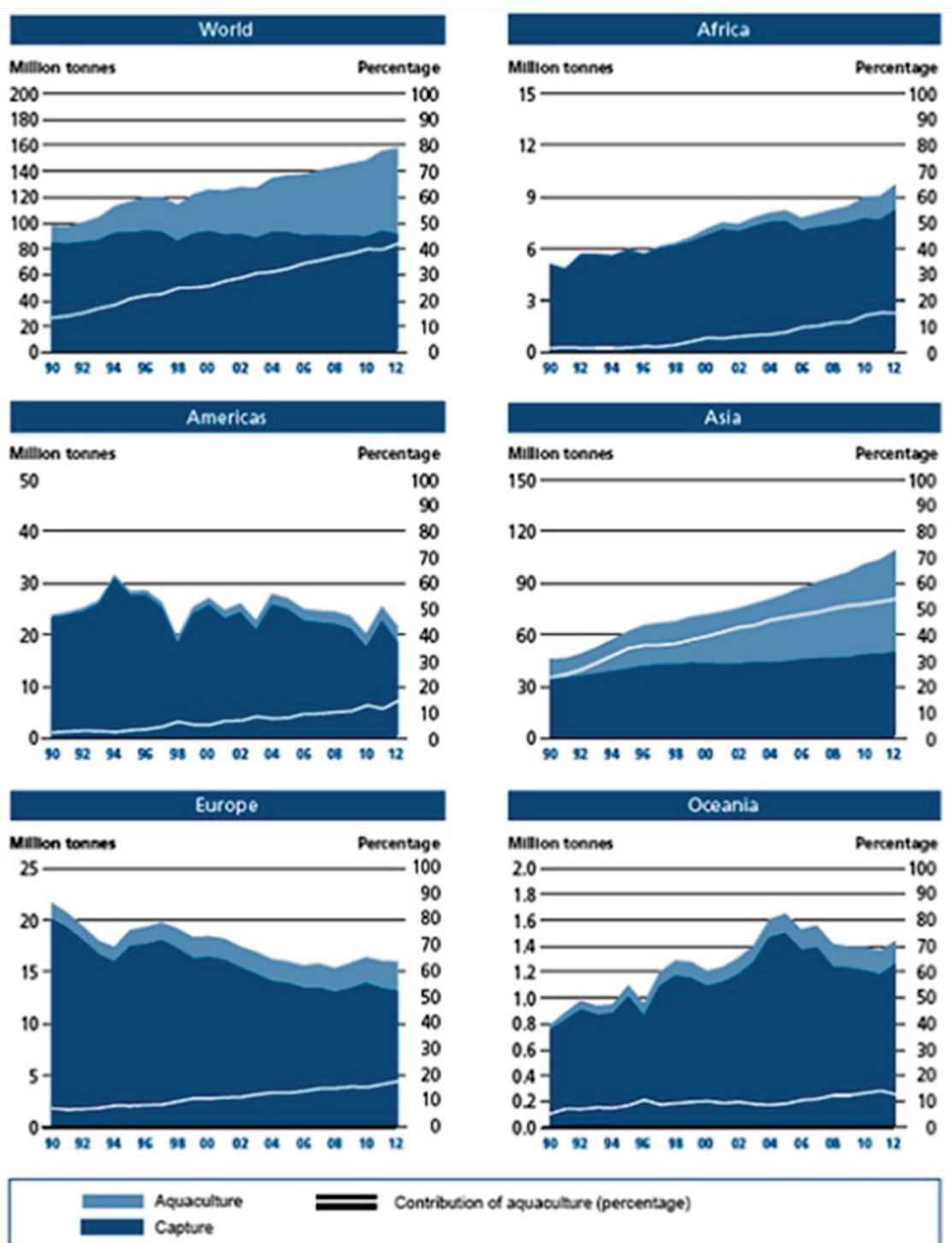
Source: FAO, *The State of the World's Fisheries and Aquaculture* (Rome, 2014), p. 3.

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<sup>32</sup> FAO, *Global and regional food consumption patterns and trends*, p. 8. See also Rosamond Naylor, Rebecca J. Goldburg, Juergen H. Primavera, Nils Kautsky, Malcolm C.M. Beveridge, Jason Clay, Carl Folks, Jane Lubchenco, Harold Mooney and Max Troell, “Effect of Aquaculture on world fish supplies”, *Nature*, 29 June 2000, p. 1017.

<sup>33</sup> Stephen A. Macko, “Global Ocean Challenges”, in Myron Nordquist, John Norton Moore, Robert C. Beckman and Ronan Long (eds.), *Freedom of Navigation and Globalization* (Brill Nijhoff: Leiden, 2015), p. 311.

<sup>34</sup> FAO, *World Review of World Fisheries and Aquaculture* (Rome: 2002), p. 29.



**Figure 3: Aquaculture and Capture Production by Global Region (1990–2012).**

Source: FAO, *The State of the World's Fisheries and Aquaculture* (Rome, 2014). p. 19.

## 2.2 Undersea Communications and Minerals

While we do not have any precise knowledge of the mineral wealth that lies in the seabed, technology is making us better informed. In the past, extraction of most minerals that had been identified was either impossible or uneconomical. As a result of technological advances, however, that situation is changing. Even if the costs are still prohibitively high today, they are unlikely to remain so forever. Environmental concerns will continue to make exploitation of deep oceanic mineral resources controversial, but their market value could make development increasingly attractive. Already, extraction of some of these resources has grown exponentially. This is especially evident in the field of energy, and oil and gas production is the world's biggest marine industry, worth more than US\$300 billion annually.<sup>35</sup> Outside of North American waters, the number of deep water oil wells has increased four-fold since 2000. Current forecasts indicate that by 2035, up to 11 percent of global production could come from deep-sea drilling.<sup>36</sup> There is also an expectation that the minerals industry is set to expand into the ocean depths.<sup>37</sup> Large deposits of minerals, such as gold, silver, zinc and copper, are believed to exist in the seabed. As global population increases and human development levels rise, so too will the demand for natural resources. Future or planned exploitation of those minerals found on the seafloor will naturally lead governments and private industry to pay greater attention to their development.

In recent years, we have increasingly come to think of the ocean depths as a resource treasure trove but, while less widely appreciated, we also rely on them to facilitate communications. By 2014, there were 213 submarine cable systems in operation, totalling 877,122 kilometres. All regions of the globe are linked directly or indirectly via these systems. With lower operating costs than satellites, undersea cables provide 97 percent of global data traffic and are essential to the operation of the internet, as well as the communications and international financial industries, not to mention national security. The Society for Worldwide Interbank Financial Telecommunications (SWIFT) transmits 15 million messages per day via submarine cables to more than 8,000 financial institutions in 208 countries or organizations. The US Clearing House Interbank Payments System (CHIPS) processes over US\$1 trillion per day in transactions to 22 countries. Undersea cables also facilitate the transmission of electrical power; between mainland Australia and Tasmania, for example, and they make possible the at-sea wind farms operated by Denmark, Germany and the United Kingdom.<sup>38</sup> And last, submarine cables are useful as a tool to advance our knowledge of the oceans. As part of a joint US-Canada project, they provide scientists with

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<sup>35</sup> Assaf Harel, "Preventing Terrorist Attacks on Offshore Platforms: Do States Have Sufficient Legal Tools", *Harvard National Security Journal*, Vol. 4, No. 1, 2012, p. 131.

<sup>36</sup> Martinage, "Under the Sea: The Vulnerability of the Commons", pp. 117-123.

<sup>37</sup> In May 2014, it was announced that a Canadian company could be involved in the world's first deep-sea mine off the coast of New Guinea. See Ariana Kaknevicius, "Canadian mining company could be involved in world's first deep-sea mine", *Canadian Geographic* (online), 13 May 2014 and Gemima Harvey, "The Deep-sea Resources Rush", *The Diplomat*, 20 August 2013. The major focus of current efforts is manganese nodules (located below 4,000 metres), gas hydrates (between 350 and 5,000 metres), cobalt crusts (found on the sides of undersea mountain ranges between 1,000 and 3,000 metres), and sulphides and sulphide muds (between 500 and 4,000 metres). See "Marine minerals", *World Ocean Review*, no date [accessed on 7 September 2014 at <http://worldoceanreview.com/en/wor-1/energy/marine-minerals/>].

<sup>38</sup> Douglas Burnett, Tara M. Davenport and Robert C. Beckman, "Why Submarine Cables?" in Douglas Burnett, Robert C. Beckman and Tara M. Davenport (eds.), *Submarine Cables: The Handbook of Law and Policy* (Martinus Nijhoff: Leiden, 2014), pp. 1-2.

access to data collected by an array of subsurface stations that are designed to “measure physical, chemical, geological, and biological phenomena from the seabed to the surface.”<sup>39</sup>

## 2.3 Seaborne Trade

Marine transport, a constant presence in the history of human development, is now a vital organ of an increasingly integrated trading system and 90 percent of global trade is conveyed by sea.<sup>40</sup> A less visible part of the global economic boom of the past two decades, world seaborne trade has tripled since 1970 and more than doubled since 1990.<sup>41</sup> It is estimated that, today, more than 100,000 commercial vessels call at over 2,800 ports in 150 countries. There are over 1.5 million seafarers and hundreds of thousands of people who work in ports, as well as over 40,000 freight forwarders in the shipping industry. Generally speaking, there are three classes of cargo ships upon which global trade depends—container ships, bulk dry carriers, and oil tankers. Each category tends to call at different ports and travel in distinct patterns and has enjoyed considerable growth in recent years.<sup>42</sup> However, it has been the increase in the number of container ships and containerisation that is largely responsible for the phenomenal growth of seaborne trade, and the number of specialised container ships has increased by 264 percent since 2000.<sup>43</sup> In terms of twenty-foot equivalents (TEUs), the standard unit for measuring container traffic, in the early-1990s there were less than seven million; two decades later, there were more than 29 million TEUs.<sup>44</sup> Even more revealing than this four-fold growth, an estimated 15 million containers make about 230 million journeys each year.<sup>45</sup> As Table 1 demonstrates, the volume of maritime trade that uses containers has enormously expanded during the past two decades.

Seaborne trade is an indicator of global economic health, and the direction that this growth has taken reflects the diffusion of power and wealth in the international system.<sup>46</sup> Western countries dominate international shipping, but China’s profile is growing.<sup>47</sup> If present trends continue, however, the greatest growth in coming decades in containerised trade will occur between the Middle East and the Far East. This will increase the strategic importance of the Indian Ocean and Asian sea lanes (see Figure 4).<sup>48</sup> Given the nature of this trade (i.e., bulk shipping of energy

<sup>39</sup> “Wiring the World Below”, *The Economist*, 4 April 2015.

<sup>40</sup> International Maritime Organisation (IMO), *International Shipping Facts and Figures – Information Resources on Trade, Safety, Security, Environment*, 6 March 2012, Section 2.1. See also Admiral Mark Ferguson, “How the Navy Protects America”, *The Boston Globe*, 29 June 2012.

<sup>41</sup> United Nations Conference on Trade and Development (UNCTAD), *Review of Maritime Transport 2013: Chapter 1* (New York and Geneva, 2013), p. 4.

<sup>42</sup> Pablo Kaluza, Andrea Kolzsch, Michael T. Castner and Bernd Blasius, “The complex network of global cargo ship movements”, *Journal of the Royal Society*, Vol. 7, 2010, p. 1094.

<sup>43</sup> Michael Ircha, “Ports and Shipping Security”, Paper presented at the 46<sup>th</sup> CRTF Annual Conference, Gatineau, Quebec, 2011 [accessed on 1 June 2014 at [www.crtf.ca/conferences/2011gatineau/2011Proceedings/IrchaPortSecurity.pdf](http://www.crtf.ca/conferences/2011gatineau/2011Proceedings/IrchaPortSecurity.pdf)], p. 1.

<sup>44</sup> Lance Hoovestal, *Globalization Contained: The Economic and Strategic Consequences of the Container* (Palgrave MacMillan: London, 2013), p. 55.

<sup>45</sup> IMO, *International Shipping Facts and Figures*, Section 3.2.

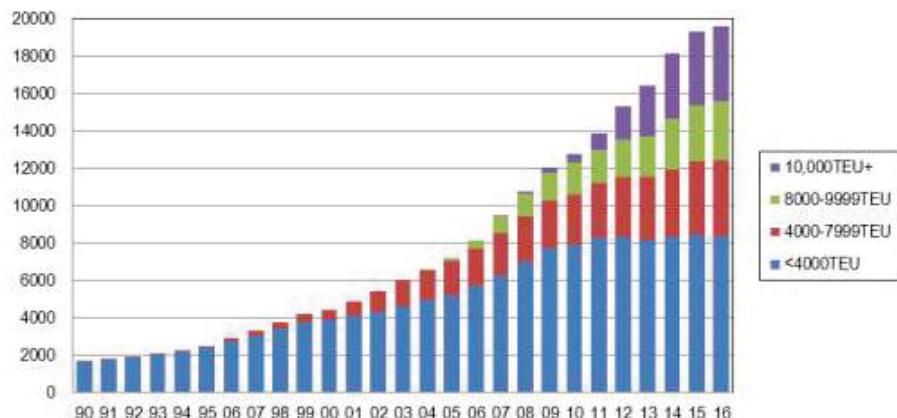
<sup>46</sup> UNCTAD, *Review of Maritime Transport 2013: Chapter 1*, p. 25.

<sup>47</sup> For example, China has overtaken the EU as Africa’s biggest trading partner and this is revealed in the growth in its seaborne trade to and from that continent. See UNCTAD, *Review of Maritime Transport 2013: Chapter 1*, p. 9.

<sup>48</sup> Lloyd’s Register Group et. al., *Global Marine Trends 2030*, p. 57.

resources) there will be continued growth in the number of larger ships, with those capable of carrying greater than 7,600 TEUs growing six times faster than smaller vessels.<sup>49</sup>

**Table 1: World Container Fleet Development, 1990–2016 (in '000s TEUs).**



Source: Ocean Shipping Consultants, *Container Traffic Forecast Study – Port Metro Vancouver*, June 2014 [www.robertsbankterminal2.com/wp-content/uploads/Port-Metro-Vancouver-Container-Traffic-Forecast-Ocean-Shipping-Consultants-June-2014.pdf], p. 105.

Seaborne trade is also a motor for national and regional economies. The continuing growth of containerization and of energy exports will lead to the further development of new ports and will create pressure—economic and political—for the upgrade of established ones. Indeed, a failure to keep pace with both the increase in the size of container ships and the volume of traffic risks ships looking to dock elsewhere with economic consequences for established populations. As seaborne trade is a driver of economic expansion, it has led to extensive investments in infrastructure along coasts and within market centres inland.<sup>50</sup> Consequently, there has been a snowballing of port upgrades and expansion leading to the situation where half of the world's wealthiest cities are ports.<sup>51</sup>

China, in particular, has benefitted from this approach. Since 2000, Beijing has invested heavily in port infrastructure to link inland cities with global markets upon which the country's economic development depends.<sup>52</sup> As a result, nine of the 25 of the world's busiest ports are currently found in that country, some of which were purpose-built for containerised trade (see Table 2). As an indicator of the global economic transformation that has taken place and is ongoing, until 2002 the distinction of being the busiest port belonged to Rotterdam: today that ranking is held by Shanghai. Other countries have acted similarly to that of China in modernising and expanding the capacity of sea ports, such as the US in its development of west coast ports. The largest of those being Los Angeles and Long Beach; however, each handle approximately one half of the volume

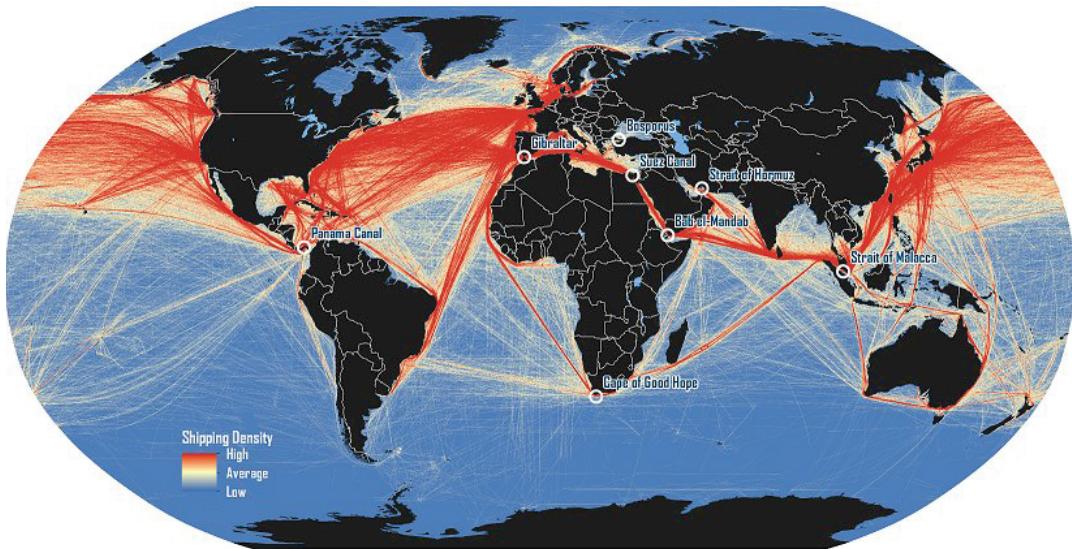
<sup>49</sup> Lloyd's Register Group et. al., *Global Marine Trends 2030*, p. 81. Some container ships now being built are capable of carrying 20,000 TEUs.

<sup>50</sup> Transportation networks are not a sufficient condition for economic and social development. However, a lack of infrastructure that links a region to a transport network will have a significant retarding effect on economic growth. This argument is made in Jean-Paul Rodrigue, *The Geography of Transport Systems*, Third Edition (Routledge: London, 2013), p. 229.

<sup>51</sup> Lloyd's Register Group et. al., *Global Marine Trends 2030*, p. 32.

<sup>52</sup> Hoovestal, *Globalization Contained*, p. 58.

of the 10<sup>th</sup> largest world port. Interestingly, those regions with inefficient facilities to engage in seaborne trade—e.g., in Africa—continue to lag behind, and are forced to endure much lower rates of economic growth.<sup>53</sup>



**Figure 4: Global Shipping Density.**

Source: Jean-Paul Rodrigue, Ph.D. Professor, Dept. of Global Studies & Geography, Hofstra University. Copyrighted. Used with permission.

**Table 2: The Top 10 World Container Ports.**

Rank	Port, Country	Volume – 2013 million TEUs	Volume – 2012 million TEUs	Volume – 2011 million TEUs
1	Shanghai, China	33.62	32.53	31.74
2	Singapore	32.6	31.65	29.94
3	Shenzhen, China	23.28	22.94	22.57
4	Hong Kong, China	22.35	23.12	24.38
5	Busan, South Korea	17.69	17.04	16.18
6	Nigbo-Zhoushan, China	17.33	16.83	14.72
7	Quingdao, China	15.52	14.50	13.02
8	Guangzhou, China	15.31	14.74	14.42
9	Dubai, UAE	13.64	13.30	13.00
10	Tianjin, China	13.01	12.30	11.59
11	Rotterdam, Netherlands	11.62	11.87	11.88
19	Los Angeles, USA	7.87	8.08	7.94
21	Long Beach, USA	6.73	6.05	6.06
47	Metro Vancouver, Canada	2.83	2.71	2.51

Source: The data is taken from World Shipping Council, *Top World 50 Container Ports* [[www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports](http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports)].

<sup>53</sup> Hoovestal, *Globalization Contained*, p. 59.

## 2.4 Regulation of Ocean Space

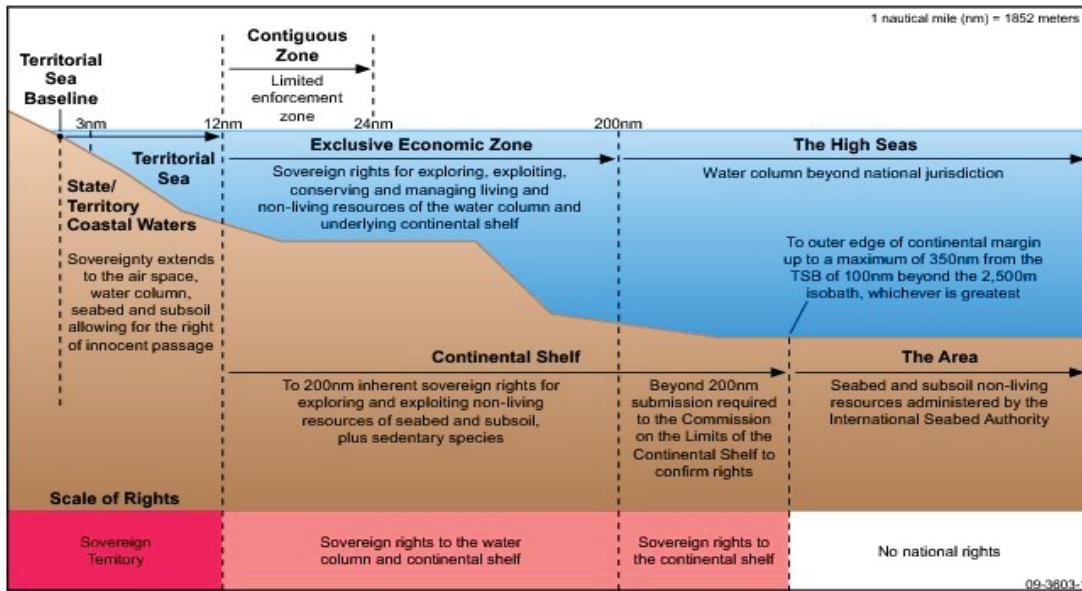
The *UN Convention on the Law of the Sea* (UNCLOS) has been called the “constitution of the sea” and it is the normative/legal framework within which many maritime issues will continue to be addressed by states.<sup>54</sup> In effect since 1994, UNCLOS seeks to reconcile the traditional emphasis on the freedom of the seas to which all have access with more recent claims made by countries to control maritime space. To accomplish this goal, it recognises the demand by countries for exclusive control over their coastal regions (hence the creation of the 200 nautical mile wide Exclusive Economic Zones or EEZs) while reasserting the principle of an ocean commons. (Figure 5 shows the relationship between territorial seas, EEZs and the high seas.) Ships, including foreign warships and military aircraft, have the formal right of innocent passage through EEZs, as indeed they do in territorial waters. Maritime countries, however, enjoy exclusive jurisdiction over the resources found within the waters of their EEZ and on its seabed. As with any treaty, tensions have arisen over the interpretation of UNCLOS. This can be viewed as natural, particularly in a system of sovereign states. The pressure for changes in the interpretation of that agreement is a reflection of the contending interests of the states most affected. This, too, will continue in coming decades for, as one leading naval theorist has written that demand for “changes in the law of the sea derive from the manifest increase in the importance of the sea relative to the land.”<sup>55</sup>

Looking forward, countries (presumably most) interested in maritime order will continue to see international law as both a useful tool to advance their interests and some might even see it as a common good. Resort to the law will be regarded as an acceptable means for the resolution of disputes, thereby making a positive contribution to international security. One sees this already. In recent years, maritime boundary disputes between Peru and Chile, and in the Barents Sea between Russia and Norway, were peacefully resolved: the former adjudicated by the International Court of Justice and the latter after nearly 40 years of bilateral negotiations. While armed conflict can never be excluded as a possibility, reliance on international law will likely be the most effective mechanism that prevents an escalation of many maritime disputes.

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<sup>54</sup> For the idea that UNCLOS represents a balance between exclusive and inclusive approaches to the oceans, see Natalie Klein, *Maritime Security and the Law of the Sea* (Oxford University Press, 2011), pp. 3–18.

<sup>55</sup> Geoffrey Till, *Seapower and the Millennium* (Sutton Publishing: Phoenix Mill, 2001), p. 6.



**Figure 5: Offshore Maritime Zones Recognised under International Law Source.**

Source: National Oceanic and Atmospheric Administration, Office of Coastal Survey  
[\[www.nauticalcharts.noaa.gov/nsd/xml2html.php?xml=coastpilot/files/cp7/CPB7\\_E47\\_C01\\_20150112\\_0913\\_WEB.xml\]](http://www.nauticalcharts.noaa.gov/nsd/xml2html.php?xml=coastpilot/files/cp7/CPB7_E47_C01_20150112_0913_WEB.xml).

### **3 Challenges to Order in the Maritime Environment**

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If one excludes the sea-based deterrents that were initially developed during the latter half of the 20<sup>th</sup> century and that contributed to both the stability and the outcome of the Cold War, it has been seventy years since the last great international conflict in which the outcome was influenced to a considerable degree by operations at sea. It has been over three decades since the Falklands War (1982) so clearly demonstrated the continuing strategic utility of sea power. With the lessons of the Falklands largely forgotten, and as the Second World War recedes into history, many people have come to assume that the maritime realm is unchanging and, despite an occasional media focus on environmental decay or contentious boundary claims, that any problems are either far away or readily manageable. Our easy familiarity with what we have has created within many Western societies what some have called *maritime blindness*.<sup>56</sup> Many of us take for granted the ready abundance of all types of foods year-round and of goods that maintain our modern standard of living without being aware that their delivery depends, at some stage, on maritime transport; and we often fail to acknowledge that the absence of sea-based threats is the consequence of efforts, in the past and ongoing, to purchase such security. In our own age, maritime strategic interests and vulnerabilities are largely overlooked.<sup>57</sup> The public is frequently unaware of the strategic challenge that could come from the sea. Looking to history, a British naval historian recently observed that “even in the darkest hours of that campaign [i.e., the Battle of the Atlantic], when the United Kingdom stood in real danger of being starved to death, there were far more stockpiles of key commodities—fuel and food—at any time than there are now in 2013.”<sup>58</sup> He was referring to a densely populated island country engaged in a life and death struggle. If the discussion had turned to current events, he might have drawn attention to the vulnerability of many advanced economies to disruptions in seaborne trade due to energy import dependence or the just-in-time approach of the commercial and manufacturing sectors.<sup>59</sup>

Modern trade and transportation technologies, and the rising threat of remote attacks (i.e., cyber) mean that the oceans cannot provide defence-in-depth to the same degree as they once did. But a greater awareness of vulnerability has not yet translated into a greater appreciation for the strategic importance of the oceans. Any lingering inclination to assume that the oceans are a limitless resource, where inter-state competition can be easily managed, or that they provide

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<sup>56</sup> One author has described the symptoms of maritime blindness as “[t]he public’s blasé expectation that what we want will be available when we want it without being mindful of how it arrives at the table, store shelf or the assembly shop floor. (...) It also describes the lack of awareness about strategic and security issues associated with international use of the ocean commons.” See Tim Dunne, “The Sad State of Maritime Blindness”, *Cutting the Bow Wave* (Combined Joint Operations from the Sea Center of Excellence: Norfolk, Virginia, 2013), p. 43. For the ongoing debate on this issue in the UK, see Jeremy J. Blackham and Gwyn Prins, “The Royal Navy at the Brink”, *RUSI Journal* (April 2007), pp. 10–16 and Lee Willett, “The Maritime Contribution to the Joint Campaign and the National Security Strategy”, *RUSI Occasional Paper* (June 2009).

<sup>57</sup> This argument is made in Jeremy Blackham and Gwyn Prins, “Why Things Don’t Happen: Silent Principles of National Security”, *RUSI Journal*, Vol. 155, No. 4, August/September 2010, pp. 16–17.

<sup>58</sup> Professor Andrew Lambert quoted in Christopher Bellamy, “Naval power: strategic relevance in the 21<sup>st</sup> century”, *Jane’s Navy International* (online), November/December 2014.

<sup>59</sup> In early-2015, for example, industry leaders warned that a shutdown of the Long Beach-Los Angeles ports, through which 40 percent of the US import trade passes, would pose a severe risk to the US national economy. See Robert Wright, “Industry warns of crippling impact of work stoppage at US ports”, *The Financial Times*, 18 January 2015.

defence-in-depth, will be overwhelmed by global developments as the current century unfolds. This will happen, in large measure, because ocean politics are being transformed by the intensity and scale of human activities at sea, by both state and non-state actors, that are upsetting the global order and by new security demands that are emerging.

### 3.1 Overfishing

The ocean calamity that is easiest to attribute to human agency is overfishing and, while it obviously impacts marine ecology, it also has profound socio-economic and political implications. In some cases, they are internationally significant, and the security of marine-based food resources will become increasingly important as populations draw heavily on fish stocks outside of their own EEZs. In part, this is due to unsustainable harvests of fish in local waters, but climate change too is playing a role. Rising ocean temperatures will force many fish species that are important as a food source to move into colder waters.<sup>60</sup> As well as exacerbating the food situation in the regions most affected by species migration, the relocation of national fishing fleets could threaten the sustainability of the resource elsewhere, lead to confrontations with fishing vessels of other countries, and force governments to regard fish as a strategic resource. This has already happened. The *Canada First Defence Strategy* (2008) identified overfishing as a security concern, a decision undoubtedly informed by the collapse in the 1980s of the once abundant cod industry along the country's east coast<sup>61</sup>; and the European Union has recently declared the "prevention of illegal, unregulated and unreported fishing" as a maritime security interest.<sup>62</sup>

The political importance of specific fisheries will grow as the oceans are over-fished. Already, according to a study conducted in 2011, the FAO concluded that 61.3 percent of the world's wild fish stocks are fully exploited, 28 percent are fished at unsustainable levels and only 10 percent were under-fished.<sup>63</sup> More significant, the unsustainable level increased from 10 percent to the current level between 1974 and 2011. The impact of overfishing on wild stocks is already evident. In Southeast Asia, for example, it is estimated that wild stocks are only 25 percent of what they were 40 years ago: other estimates are even more alarming, with the possibility that the loss in those waters is in the order of 95 percent.<sup>64</sup> Recovery from such depleted levels is difficult, often

<sup>60</sup> Record warming of the Northeast Atlantic witnessed the range of various fish species off the New England coast begin to shift northward, while in 1999 "a warm event" contributed to a massive die-off of lobster in Long Island Sound.<sup>60</sup> Such developments are occurring globally, but they are far more politically salient in the tropics where intense fishing contributes to widespread destruction of coral reefs thereby threatening an ecosystem's ability to sustain biological diversity (i.e., fish stocks). Botsford et al., "The Management of Fisheries and Marine Ecosystems", p. 510. See also Harriet Jarlett, "Climate change could mean fisheries lose profit by 2050", *PhysOrg*, 10 June 2014 [accessed 10 October 2014 at [phys.org/news/2014-06-climate-fisheries-profit.html](http://phys.org/news/2014-06-climate-fisheries-profit.html)] and Heather Amos, "Fish moving poleward at rate of 26 kilometres per decade", *PhysOrg*, 10 October 2014 [accessed on 10 October 2014 at [phys.org/news/2014-10-fish-poleward-kilometres-decade.html](http://phys.org/news/2014-10-fish-poleward-kilometres-decade.html)].

<sup>61</sup> Canada, Minister of National Defence, *Canada First Defence Strategy*, Ottawa, October 2008, p. 7.

<sup>62</sup> Council of the European Union, European Union Maritime Security Strategy, Brussels, 24 June 2014, p. 7.

<sup>63</sup> FAO, *State of the World Fisheries and Aquaculture and Progress in the implementation of the Code of Conduct for Responsible Fisheries and Related Instruments*, Rome, March 2014 [accessed on 10 August 2014 at <http://www.fao.org/3/a-mk055e.pdf>], para. 14.

<sup>64</sup> Ralf Emmers, *Resource Management in the South China Sea: An Unlikely Scenario?*, Paper presented at the Conference on Recent Development of the South China Sea Dispute and Prospects of Joint Development Regime, Haikou, 6 to 7 December 2012 [accessed on 3 September 2014 at [www.nanhai.org.cn/include\\_lc/upload/UploadFiles/2013129100941408.pdf](http://www.nanhai.org.cn/include_lc/upload/UploadFiles/2013129100941408.pdf)], p. 4.

impossible, and certainly not a short-term likelihood. The impact of the loss or reduction in availability of an important food source is already visible. In Sub-Saharan Africa, where food resources are not always adequate, fish consumption has begun to decline, placing greater stress on other (often strained) food resources.<sup>65</sup> Some commentators have even contended that there could be a connection between overfishing and piracy.<sup>66</sup>

Magnifying the problem of over-fishing is “illegal, unreported and unregulated (IUU) fishing.”<sup>67</sup> It was described in a report issued by the UN Secretary-General as “the main obstacle in achieving sustainable management of fishery resources.”<sup>68</sup> It is believed that the principal cause of IUU is profit, as IUU fishing “can lower administrative and operating costs, avoid paperwork, ignore quotas and still charge premiums from unknowing buyers (or, indeed, those who do not care to know).” Regardless of its cause, the scale of the problem is imposing. A study by the Pew Charitable Trusts estimated that one-fifth of all fish sold in stores or restaurants, worth about US\$23 billion annually, is caught illegally. It observed that, in some regions, the scale of illegal fish might reach as much as 40 percent of the total catch.<sup>69</sup> Not only does IUU fishing target wild stocks that are often already severely stressed but there can be socio-economic implications. Local economies are harmed as income patterns are disrupted with coastal communities and developing societies most at risk from foreign-based IUU fishing. In 2011, the Republic of Congo banned dozens of Chinese ships from its waters due to IUU activities; and, in 2013, a South Korean ship was denied access to a port due to evidence of IUU fishing of local tuna.<sup>70</sup> A significant challenge in confronting IUU fishing is that many international accords directed at the problem, such as the FAO’s *Port State Measures Agreement* (2009), that its advocates believe will be both cost-effective and efficient, lack implementation strategies, policy and legal frameworks, and operational mechanisms.<sup>71</sup>

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<sup>65</sup> UNGA, *Oceans and the law of the sea: Report of the Secretary-General*, p. 9.

<sup>66</sup> See, for example, Ishaan Tharoor, “How Somalia’s Fishermen Became Pirates”, *Time*, 18 April 2009.

The claim of a causal link is, however, disputed. Those who reject a direct linkage argue that, however desperate the plight of the fishing industry near the Horn of Africa and off the coast of East Africa, the majority of apprehended pirates have never been fishermen. Moreover, foreign fishing fleets targeted stocks that the locals seldom exploited. See Ghassan Schbley and William Rosenau, *Piracy, Illegal Fishing and Maritime Insecurity in Somalia, Kenya and Tanzania*, Center for Naval Analysis, November 2013 and Vanda Felbab-Brown, *Evolution and Realities of Piracy and Illegal Fishing in African Gulfs* (Brookings Institute: Washington, D.C., 9 December 2013).

<sup>67</sup> The phrase *illegal, unreported and unregulated fishing* is used by the UN, the FAO and the International Maritime Organisation. See Seokwoo Lee, Anastasia Telesetsky and Clive Schofield, “Slipping the Net: Why is it so Difficult to Crack Down on IUU Fishing?” in Nordquist et al., *Freedom of Navigation and Globalization*, pp. 94–95.

<sup>68</sup> Quoted in Lee et al., “Slipping the Net: Why is it so Difficult to Crack Down on IUU Fishing?” in Nordquist et al., *Freedom of Navigation and Globalization*, p. 88.

<sup>69</sup> Pew Charitable Trusts, “Pew Unveils Pioneering Technology to Help End Illegal Fishing”, *Press Release*, 21 January 2015 [accessed on 26 February 2015 at [www.pewtrusts.org/en/about/news-room/press-releases/2015/01/21/pew-unveils-pioneering-technology-to-help-end-illegal-fishing](http://www.pewtrusts.org/en/about/news-room/press-releases/2015/01/21/pew-unveils-pioneering-technology-to-help-end-illegal-fishing)].

<sup>70</sup> Lee et al., “Slipping the Net: Why is it so Difficult to Crack Down on IUU Fishing?” in Nordquist et al., *Freedom of Navigation and Globalization*, pp. 91–93.

<sup>71</sup> FAO, *State of the World Fisheries and Aquaculture and Progress in the implementation of the Code of Conduct for Responsible Fisheries and Related Instruments*, para 49. Interestingly, the Port State Measures Agreement had not yet become binding international law by late-2015.

Aquaculture will almost certainly relieve pressure on some wild fish stocks and, if trends continue, it will increase the global supply of fish-based proteins. This is particularly important for countries heavily dependent on maritime food resources. As a consequence, while the growth of aquaculture worldwide has slowed somewhat in recent years, Asia today accounts for nearly 88 percent of fish farming. China, in particular, is responsible both for the increased size of the industry and for the overall growth in global fish supply as a result (see Figure 6).

Some people nevertheless argue that aquaculture's success is a mixed blessing. An FAO report echoed this concern when it noted that the "legal and institutional frameworks for aquaculture and integrated coastal management remain scarce."<sup>72</sup> That expression of concern is warranted due to the fact that aquaculture is not managed the same everywhere. While management of the industry has improved considerably over the past decades, modernisation has not been universal.<sup>73</sup> A number of scientists argue, therefore, that ecological considerations ought to temper the enthusiasm for aquaculture.<sup>74</sup> These claims are, however, disputed by others who counter that some of the evidence is inadequate or misinterpreted, and cannot in any case be applied to aquaculture everywhere. As this paper is being written, the debate within the scientific community (and beyond) shows no sign of abating.<sup>75</sup> It underscores the limits of our knowledge of the relationships between marine ecology and the maritime environment, and of the possible consequences of human activity in the maritime sphere.

International agreements to balance exploitation of wild fish stocks with long-term sustainability are also under stress or non-existent. Fisheries policy-makers recognise that fish stocks must be developed and used in ways that are sustainable. However, continued attempts by some countries to use fisheries as the key to solving social and economic issues, as well as political pressures in all countries for short-term economic gain, threaten to overwhelm the recognition that if overfishing continues they will not be available to assist social or economic development.<sup>76</sup> As a

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<sup>72</sup> FAO, *State of the World Fisheries and Aquaculture and Progress in the implementation of the Code of Conduct for Responsible Fisheries and Related Instruments*, para. 33.

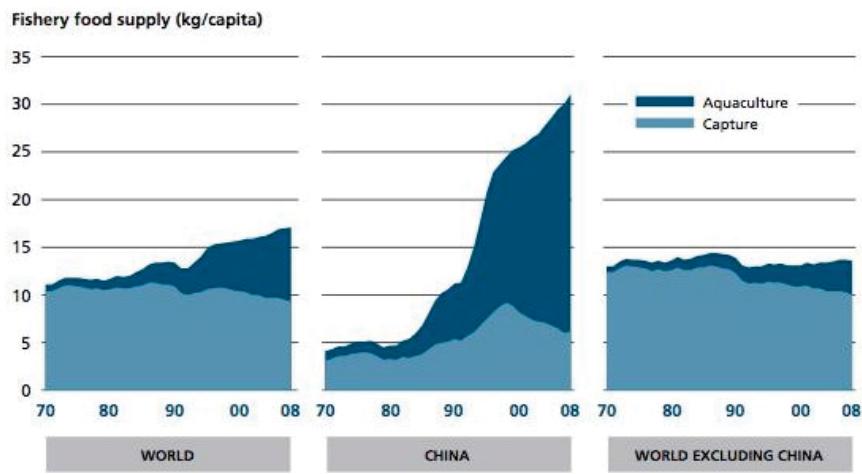
<sup>73</sup> For a discussion of the improved conditions in US aquaculture, see Michael B. Rust, Kevin H. Amos, April L. Bagwill, Walton W. Dickhoff, Lorenzo M. Juarez, Carol S. Pierce, James A. Morris Jr., Michael C. Rubino, "Environmental Performance of Marine Net-Pen Aquaculture in the United States", *Fisheries*, Vol. 39, No. 11, November 2014, pp. 509–513.

<sup>74</sup> This is based on the argument that the dependence of fish farming on water exchange makes it vulnerable to the effects of climate change, namely rising water temperatures and storms (See United Kingdom, Ministry of Defence, *Global Strategic Trends – Out to 2045* (London, April 2014, p. 34.) Arguments against fish farming include: that the degradation of the sea floor is a likely consequence of net pens; that the hundreds of thousands of farmed fish which escape into the wild each year transmit diseases to wild stocks, along with reducing the genetic diversity of those communities; and that two to five times more fish protein, in the form of fish meal, is needed to feed the farmed species than is supplied by the farmed product. (See Naylor et al., "Effect of Aquaculture on world fish supplies", p. 1018.) One study also noted that "more effluent flows into the East and South China seas from shrimp ponds than from industry." (Dominic Ziegler, "A sea of expectations", *The Economist: The World in 2014*, no date, p. 77.) Overall, therefore, critics charge that aquaculture can lead to loss of fish, as well as coastal habitat destruction, pollution and significant ecological damage.

<sup>75</sup> A recent study of Norwegian salmon farming contradicted accepted wisdom when it concluded, despite the presence of escaped fish, that the genetic diversity of the wild stock "still appears to be retained." See Kevin A. Glover, Maria Quintela, Vidar Wennevik, Francois Besnier and Anne G. E. Sorvik, Three Decades of farmed Escapees in the Wild: A Spatio-Temporal Analysis of Atlantic Salmon Population Genetic Structure throughout Norway", *Plos One*, Vol. 7, Issue 8, August 2012, [accessed on 25 February 2015 at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0043129>], pp. 1–18.

<sup>76</sup> FAO, *State of the World Fisheries and Aquaculture*, p. 42.

result, confrontations between governments are near-certain and some of these will obviously occur at sea. This has already happened, notably the Cod Wars (1950s to 1970s) between Great Britain and Iceland and the so-called Turbot War (1995) between Spain and Canada.



**Figure 6: China's Relative Contribution to Food Fish Consumption (1970–2008).**

Source: FAO, *State of World Fisheries and Aquaculture 2010* (Rome, 2010), p. 68.

There is limited support for increased international management of fish stocks because, as one would expect, national governments have subordinated global concerns to national interests. This has meant that achieving consensus in some international bodies is impeded, for a declining resource is increasingly difficult to manage when so many vested interests will be affected.<sup>77</sup> The result has been, as one author notes, “declining fish stocks in disputed East Asian waters have led to a further overexploitation of fisheries rather than the joint management of marine resources.”<sup>78</sup> As national fishing fleets have moved away from depleted home waters, particularly in Asia or into areas where maritime boundaries are disputed, clashes at sea are a likely consequence. According to one study, between 1989 and 2010, there were 380 cases of Chinese fishermen “attacked, robbed, detained or killed by neighbouring countries.” The situation has become so sensitive in China that in 2012 a fishing industry executive advocated arming the country’s fishing fleet.<sup>79</sup> Violence (state-sponsored or otherwise) over fishing rights is already contributing to the tensions between regional Powers, such as Japan and South Korea<sup>80</sup> and between Taiwan, Japan and China (e.g., the Senkaku/Diaoyu Islands). Building upon existing political frictions, these disputes have the potential to spark a serious escalation possibly leading to armed conflict.<sup>81</sup>

<sup>77</sup> Roberts, *Oceans of Life*, p. 327.

<sup>78</sup> Emmers, *Resource Management in the South China Sea: An Unlikely Scenario?*, p. 4.

<sup>79</sup> Barthal-Datta, “Food Security in Asia: Challenges, Policies and Implications”, p. 120.

<sup>80</sup> See Toko Sekiguchi and Kwanhoo Jun, “Japan, South Korea Ban Each Other’s Fishing Boats”, *The Wall Street Journal* (online), 4 July 2014.

<sup>81</sup> See Andrew Welch, *The Royal Navy in the Cod Wars; Britain and Iceland in Conflict, 1958-61, 1972-73, 1975-76* (Maritime Books: Liskeard, 2006), Marvin Soroos, “The Turbot War: Resolution of an International Fishery Dispute”, in N. P. Gleditsch et. al. (eds.), *Conflict and the Environment* (Kluwer Academic Publishers: Dordrecht, the Netherlands, 1997), pp. 235–252, “A positive step in Senkaku dispute”, *The Japan Times*, 14 April 2013 and Jim Haw, “The Senkaku/Diaoyu Island Dispute in the East China Sea”, *Expeditions - Scientific American* (online blog), 7 June 2013 [accessed on 8 September 2014 at <http://blogs.scientificamerican.com/expeditions/2013/06/07/the-senkakudiaoyu-island-dispute-in-the-east-china-sea/>].

Some countries have begun to take harsh counter-measures that could further inflame regional affairs. In applying its new maritime doctrine (2014), Indonesia has seized and scuttled Vietnamese and Thai vessels, and seized a number of Chinese fishing boats.<sup>82</sup> Should economic and political pressures lead to attempts to exploit the waters of the Arctic and Antarctic, “fishing’s final frontiers”<sup>83</sup>, international tensions would likely ensue.

Perhaps even more ominous in the long-term is the possibility that the oceans might experience the fate commonly known as the *tragedy of the commons*.<sup>84</sup> Application of this concept, that originally offered insight into the history of feudal England, argues more generally that in the absence of effective governance environmental decay and ruin is inevitable. Alongside overfishing, where the relevance of the commons analogy is most readily apparent, the emergence of dead zones in the ocean coastal zones would seem analogous. While there is research to support a conclusion that dead zones are a naturally occurring phenomenon and are affected by climate change, the fact that some are found near major population centres has led some scientists to posit that human activity is implicated. In some cases, intense agricultural and industrial activity has spilled nutrients (e.g., nitrogen) into the water and led to the depletion of oxygen such that no marine life can be sustained (a process termed eutrophication).<sup>85</sup> The number of such zones has doubled every decade since the 1960s and some forecasts indicate that they could increase in the tropical oceans by more than 50 percent in coming decades.<sup>86</sup> Should this happen, serious consequences will follow in some of the most productive fishing grounds, with cascading economic and political fallout similar to that flowing from depletion of fish stocks.<sup>87</sup>

The implications for the international community of failing to make progress on these issues are obvious. However, the drafting and implementation of international agreements to address pressing dangers facing the oceans commons, such as overfishing, aquaculture and dead zones, that by their nature require that immediate national interests be set aside to preserve a long-term public good, will be extremely difficult. And yet failure to do will most probably generate international tensions that, when combined with other maritime security considerations, will be difficult for governments to manage.

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<sup>82</sup> Mervyn Piesse, *The Indonesian Maritime Doctrine: Realising the Potential of the Ocean* (Future Directions International: Dalkeith, Australia: 22 January 2015), pp. 5–6.

<sup>83</sup> Lieutenant-Commander Ray Snook (RCN), “The Future Fight for Fish”, *Canadian Naval Review*, Vol. 7, No. 2, Summer 2011, p. 11.

<sup>84</sup> The idea of the “tragedy of the commons”, in which unregulated use of a common good results in its depletion was explored in Garrett Hardin, “The Tragedy of the Commons”, *Science*, Vol. 162, December 1968, pp. 1243–1248. In this article, he described the concept as “[e]ach man is locked into a system that compels him to increase his [benefit] without limit – in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.”

<sup>85</sup> Roddy Scheer and Doug Moss, “What Causes Ocean ‘Dead Zones’?”, *Scientific American* (online), 25 September 2012, Cheryl Lyn Dybas, “Dead Zones Spreading in World Oceans”, *Bioscience*, Vol. 55, No. 7, 2005, pp. 552–557, and Stephen R. Carpenter, “Phosphorus control is critical to mitigating eutrophication”, *Proceedings of the National Academy of the Sciences*, Vol. 105, No. 32, 2008, pp. 11039–11040.

<sup>86</sup> Robert J. Diaz and Rutger Rosenberg, “Spreading Dead Zones and Consequences for Marine Ecosystems”, *Science*, Vol. 321, 15 August 2008, pp. 926–928.

<sup>87</sup> Quirin Schmeier, “Marine dead zones set to expand rapidly”, *Nature*, 14 November 2008.

### 3.2 Submarine Cables

Given their significance to global communications and commerce (as discussed earlier), experts frequently draw attention to the vulnerability of undersea cables to damage. Regardless of whether the damage is intentional or the consequence of accident or natural disaster, the impact when such damage has occurred has been considerable. Natural phenomena account for about 10 percent of the damage to submarine cables. Underwater currents (“turbidity currents”) created by undersea earthquakes can flow for hundreds of kilometres with sufficient power to snap cables. One such incident followed the Hengchun earthquake near Taiwan in December 2006 and affected undersea cable connections to China, Japan, the Philippines, Singapore, Taiwan and Vietnam, with the result that it took 11 ships and 49 days to repair.<sup>88</sup> In other cases, storm-induced wave action, as happened with Hurricane Iwa (1982) near Hawaii and Hurricane Sandy (2012) off New England, each broke a number of submarine cables. Violent storms have also severely damaged shore-based cable stations. Looking to the future, submarine cable networks will not be immune from the effects of climate change, with a projected increase in number and intensity of major storms.<sup>89</sup>

Nevertheless, a 2007 study concluded that more than three-quarters of all cable faults are caused by human activity.<sup>90</sup> Most of this occurs on the continental shelf in waters less than 200 metres deep and is the result of ships’ anchors, fishing behaviour and dredging activities. In one case, in 1986 a Chilean container ship accidentally broke three of four trans-Atlantic cables by mistakenly dragging its anchor chain for several kilometres off the coast of New Jersey.<sup>91</sup> That an estimated 65 percent of unintentional damage to submarine cables is occurring in coastal waters is not surprising given the intensification of human activity there in recent decades.<sup>92</sup>

Intentional damage to submarine cables, a new and at present a relatively rare occurrence, has become a concern for those looking at critical infrastructure protection. In both world wars, cutting undersea cables was a highly effective means of disrupting enemy communications.<sup>93</sup> Cables were also a target of espionage in the Cold War with the US tapping Soviet undersea cables, and more recent revelations indicate that cables continue to be viewed as an important

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<sup>88</sup> Chih-Chieh Su, Jing Ye-Tseng, Ho Han-Hsu, Cheng Shing-Chiang, Ho-Shing Yu, Saulwood Lin, and James T. Liu, “Records of Submarine Hazards off SW Taiwan” J. P. Terry and J. Goff (eds.), *Natural Hazards in the Asia-Pacific Region: Recent Advances and Emerging Concepts* (Geological Society: London, 2012), p. 45. For the impact on Taiwan, see Jon Herskovitz and Rhee So-eui, “Taiwan quake shakes confidence in undersea links”, *The Washington Post*, 28 December 2006.

<sup>89</sup> Carter, “Submarine Cables and Natural Hazards”, in Burnett et al., *Submarine Cables: The Handbook of Law and Policy*, pp. 241–252.

<sup>90</sup> Robert Wargo and Tara M. Davenport, “Protecting Submarine cables from Competing Uses”, in Burnett et al., *Submarine Cables: The Handbook of Law and Policy*, p. 256.

<sup>91</sup> The incident is described in Mick Green and Keith Brooks, “The Threat of Damage to Submarine Cables by the Anchors of Ships Underway”, *CIL-ICPC Workshop on the Protection of Submarine Cables* (National University of Singapore: 2011) [accessed on 20 February 2015 at <http://cil.nus.edu.sg/programmes-and-activities/past-events/international-workshop-cil-icpc-workshop-on-the-protection-of-submarine-cables/powerpoint-presentations-and-papers-presented-at-the-2011-workshop/>], p. 3, fn. 4.

<sup>92</sup> Lionel Carter, “Submarine Cables and Natural Hazards”, in Burnett et al., *Submarine Cables: The Handbook of Law and Policy*, p. 238.

<sup>93</sup> Jessica Woodall, “Australia’s vulnerable submarine cables”, *The Strategist* (online), 31 May 2013.

source of intelligence (purportedly sometimes with the assistance of telecom firms).<sup>94</sup> In our own time, a main source of anxiety is either a terrorist attack or theft by pirates. Indeed, there have already been several incidents where cables were stolen, probably by pirates, or sabotaged.<sup>95</sup>

Many national governments acknowledge the dependence of their national communications networks and economies, as well as their international connection, on submarine cable transmissions. Some (e.g., the US) have already identified cables as critical infrastructure. “If the exact location of the 36 cables in the U.S. were identified,” one report notes, “a successful attack on a few of these locations could affect roughly 95% of East coast internet traffic.”<sup>96</sup> A number of other countries have, therefore, taken actions to protect cables in territorial waters, the region of the maritime sphere where their writ is unchallenged. Some states (e.g., China, Denmark, Indonesia, Russia, Singapore, and the UK) have established minimum separation distances to protect cables from any other marine activities that might pose a hazard. Others, such as Australia and New Zealand, have created cable protection zones which are enforced with air and sea patrols, the infringement of which can carry very stiff penalties.<sup>97</sup>

From the perspective of enhancing maritime security, the challenge of preventing intentional damage to submarine cables highlights the absence of an international prohibition on such activity when it occurs within a state’s territorial waters. This is a large gap in the legal protection given to undersea cables that must pass through the waters before the open seas are reached. Neither the *Convention on the Protection of Submarine Cables* (1884) nor UNCLOS a century later addresses this issue. The drafters of the latter apparently assumed that the common interest in the preservation of undersea communications precluded a need to criminalise intentional damage to cables leaving the issue to national authorities.<sup>98</sup> UNCLOS does require states to impose criminal sanctions for wilful damage to cables by their nationals on the high seas or within their EEZs. In other words, it “obligates States to create an offence for the breaking or injury of a submarine cable by their nationals (including ships flying their flag) in areas outside any State’s territorial

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<sup>94</sup> Olga Kazan, “The Creepy, Long-Standing Practice of Undersea Cable Tapping”, *The Atlantic* (online), 16 July 2013, Gavin Sheridan, Flach Kelly, John McManus, “UK spy base GCHQ tapped Irish internet cables”, *The Irish Times*, 29 November 2014, and Richard Chigwin, “Snowden doc leak lists submarine cables tapped by spooks”, *The Register* (online), 26 November 2014 [accessed on 5 April 2015 at [www.theregister.co.uk/2014/11/26/snowden\\_doc\\_leak\\_lists\\_all\\_the\\_compromised\\_cables/](http://www.theregister.co.uk/2014/11/26/snowden_doc_leak_lists_all_the_compromised_cables/)].

<sup>95</sup> In November 2007, a cable near Bangladesh was sabotaged for reasons that remain unknown, cutting the overseas communications of the country for one week. In March 2013, several persons in Egypt were arrested after an attempt was made to cut the SEA-ME-WE-4 cable that runs from France across the Mediterranean to Alexandria and from there further east to Singapore. In mid-2013, 32 kilometres of cable linking Singapore and Indonesia were reported as having been stolen. Robert Beckman, “Protecting Submarine Cables from Intentional Damage – The Security Gap”, in Burnett et al, *Submarine Cables: The Handbook of Law and Policy*, pp. 282–283.

<sup>96</sup> Commander Michael Matis (USN), *The Protection of Undersea Cables: A Global Security Threat*, (US Army War College Strategy Research Project: Carlisle Barracks, Pennsylvania, March 2012), p. 9.

<sup>97</sup> United States, Federal Communications Commission, Communications Security, Reliability and Interoperability Council, *Final Report – Protection of Submarine Cables through Spatial Separation*, December 2014, pp. 9–10.

<sup>98</sup> See Douglas R. Burnett, *UNCLOS and Submarine Cables*, Presentation at the Submarine Cable Workshop, China Institute of Maritime Affairs and Center for Law and Policy, Beijing, 7–8 May 2009 [accessed on 25 March 2015 at <http://cil.nus.edu.sg/wp/wp-content/uploads/2009/10/UNCLOS-AND-SUBMARINE-CABLES-CHINA-INSTITUTE-OF-MARITIME-AFFA.pdf>].

jurisdiction.”<sup>99</sup> There is, however, no internationally recognised enforcement jurisdiction within EEZs where only flag states have the right to board or detain vessels engaged in such activities, if those attacking cables are ever caught in the act. And, as the discussion below will indicate, there is often a problem with assigning a regulatory function to flag states when they are often unwilling or unable to perform such a policing function.<sup>100</sup> In 2011, the UN General Assembly urged an expansion of international legal protections for undersea cables to close this gap, but that has not yet happened. One expert has written that “the potential terrorism threat posed to submarine cables has not been recognised or addressed. Therefore the legal regime governing submarine cables has been neglected, and is in need of review.”<sup>101</sup>

### 3.3 Competition for Undersea Resources

Offshore petroleum facilities suffer from an even greater vulnerability than undersea cables because they are more easily accessible and, in the eyes of those contemplating hostile action, are a more high-profile target. Since 2004, there has been an increase in attacks on offshore petroleum facilities, including drilling rigs, storage and offloading units, oil export terminals, oil derricks, wellheads and flow stations. Such incidents have taken place in all regions of the world, though the waters of Africa’s west coast are particularly targeted, and they have involved terrorist organizations, environmental groups and, in several cases, governments.<sup>102</sup> More recently, attention has focused on the threat posed by cyber-attacks to oil infrastructure and several such incidents have taken place. Already, it is estimated that the damages inflicted by cyber-attacks could cost the oil industry upwards of US\$1.9 billion by the end of the current decade.<sup>103</sup>

Alongside the disruption to oil production and revenue generation, attacks on oil and gas facilities have the potential to cause significant and long-term damage to the local marine environment and economy. This has led some countries to mandate their navies to protect offshore facilities. The Indian Navy, for example, is required to safeguard over 150 offshore platforms and 3,000 kilometres of undersea pipeline.<sup>104</sup> But such a responsibility undoubtedly stretches the capacity of navies to address more traditional duties. Other approaches have also been considered, but proposals by some governments (e.g., Australia) to impose security restriction zones in their EEZs have encountered broad international criticism that such actions could violate the right of innocent passage guaranteed by UNCLOS.<sup>105</sup>

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<sup>99</sup> Robert Beckman, *Submarine Cables – A Critically Important but Neglected Area of the Law of the Sea*, Paper presented at the 7th International Conference on Legal Regimes of Sea, Air, Space and Antarctica, New Dehli, 15–17 January 2010 [accessed on 27 March 2015 at <http://cil.nus.edu.sg/wp/wp-content/uploads/2010/01/Beckman-PDF-ISIL-Submarine-Cables-rev-8-Jan-10.pdf>], p. 11.

<sup>100</sup> Klein, *Maritime Security and Law of the Sea*, p. 104.

<sup>101</sup> Beckman, “Protecting Submarine Cables from Intentional Damage – The Security Gap”, in Burnett et al, *Submarine Cables: The Handbook of Law and Policy*, pp. 286–297.

<sup>102</sup> See Michael Kashubsky, “A Chronology of Attacks on and Unlawful Interferences with, Offshore Oil and Gas Installations, 1975–2010”, *Perspectives on Terrorism*, Vol. 5, Nos. 5–6, 2011 [accessed on 21 December 2014 at [www.terrorismanalysts.com/pt/index.php/pot/article/view/offshore-gas-and-oil-attacks](http://www.terrorismanalysts.com/pt/index.php/pot/article/view/offshore-gas-and-oil-attacks)].

<sup>103</sup> “Experts warn that the global shipping industry is vulnerable to cyber-attack”, *Reuters*, 24 April 2014.

<sup>104</sup> Gareth Evans, “Enforcing Free Trade”, *Naval Technology* (online), 11 March 2008.

<sup>105</sup> Harel, “Preventing Terrorist Attacks on Offshore Platforms: Do States Have Sufficient Legal Tools”, pp. 154–155.

Exploitation of deep-sea ocean minerals is often strategically significant and that also raises the political stakes surrounding their development. This is most obvious with regard to hydrocarbons, and some existing maritime disputes have been exacerbated when governments suspect or are certain that vast energy resources lie within disputed waters. The Sino-Japanese dispute in the East China Sea is, for example, inflamed by Tokyo's fear that Beijing will syphon off Japan's share of a large oil and gas field that straddles the two countries' EEZs.<sup>106</sup> Developing deep ocean resources might be viewed by governments as a means of reducing a dependence on a foreign source that is viewed as a strategic vulnerability. Under a policy that was only abandoned in early-2015, China's use of its near-monopoly of the production of rare earth minerals as a diplomatic lever, with export restrictions used to signal displeasure to foreign governments, led Japan to consider the development of similar deposits within its EEZ, despite the high cost of doing so.<sup>107</sup> Furthermore, the increasing importance of deep-sea resources might influence (perhaps even help precipitate) conflict on land. Russia's decision to seize Crimea from Ukraine in early-2014 was not likely determined, but it might have been influenced, by the presence in Ukraine's Crimean EEZ of oil and gas fields.<sup>108</sup> Moscow's acquisition of these resources has significantly reduced Kyiv's domestic production and threatens to increase its energy dependence on Russia. Lastly, deep-sea mineral extraction has the potential to heighten inter-state competition, even in waters where tensions are relatively limited. A permit issued by the International Seabed Authority (ISA) in 2011 to allow Beijing to explore for deep-sea minerals off the coast of Madagascar alarmed some Indian Ocean states already sensitive about Chinese naval activities in those waters.<sup>109</sup>

### 3.4 Seaborne Trade as a Security Issue

The reliance on container traffic is a growing challenge to maritime security due to the difficulty presented by efforts to create an effective screening regime. If stowaways, some of whom are serving criminal or terrorist groups, continue to pose a major problem in the modern maritime trading system, in the post-9/11 world the vulnerabilities presented by reliance on containers are now seen as the greater danger.<sup>110</sup> Such concerns are not far-fetched and it is difficult to predict when they will be overcome, if at all. We do know, however, that the "bad guys" of whatever stripe have been interested in using containers for illicit purposes in the past, and it is only logical to assume that they still are. In August 2003, for example, reports emerged that a senior member

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<sup>106</sup> Evans, "Enforcing Free Trade."

<sup>107</sup> Cecilia Jamasmie, "China scraps decade-old rare earth export quotas", *Mining.com*, 6 January 2015 [accessed on 7 January 2014 at [www.mining.com/china-scrap-decade-old-rareearths-export-quotas-44322/](http://www.mining.com/china-scrap-decade-old-rareearths-export-quotas-44322/)]. See also Behr et al., "Maritime Security in a Multipolar World: Towards an EU Strategy for the Maritime Commons", p. 4 and Alessandro Bruni, "The Sino-Japanese Dispute over the Senkaku Islands Highlights the Beginning of the end of China's Rare Earth Monopoly", *Investorintel.com*, 19 September 2012 [accessed on 26 August 2014 at <http://investorintel.com/r+are-earth-intel/the-sino-japanese-dispute-over-the-senkaku-islands-highlights-the-beginning-of-the-end-of-chinas-rareearths-monopoly/>].

<sup>108</sup> This argument is made in Frank Umbach, "Energy was a Key factor in Russia's Move on Crimea", *World Review* (online), 23 June 2014. With regard to Crimea's offshore resources, see William J. Broad, "In Taking Crimea, Putin Gains a Sea of Oil Resources", *The New York Times*, 17 May 2014, and Pavel Baev, "The Black Sea Dimensions of the Russia-EU Dialogue", *Paper presented at the 4<sup>th</sup> Annual Energy and the Black Sea Basin conference*, Istanbul, 18 May 2005 [accessed on 11 September 2014 at [www.prio.org/Publications/Publication/?x=385](http://www.prio.org/Publications/Publication/?x=385)].

<sup>109</sup> Joel D. Adriano, "Deep-sea mining stirs risk concerns", *Asia Times*, 5 August 2011.

<sup>110</sup> According to the International Maritime Organisation, between 1998 and 2011, 130,000 stowaways were found on ships. See Hoovestal, *Globalization Contained*, p. 77.

of al Qaeda had tried to buy into a company that regularly shipped containers from Karachi to New York.<sup>111</sup> Navies are inevitably employed in countering these activities. The Israeli Navy regularly intercepts ships in the Mediterranean sailing to Lebanon engaged in Iranian weapons smuggling to support its proxy Hezbollah.<sup>112</sup> In conjunction with the US, the Royal Canadian Navy's OP Caribbe is an ongoing effort to reduce the flow of narcotics to the North American market.

Improving the security of global seaborne trade engages more than just navies. In the face of human trafficking, illegal migration, the trade in illegal narcotics, smuggling and terrorism, the challenge of improving safety in the world's shipping industry and in ports is daunting. According to one study, the security of the maritime transportation system's infrastructure "depends on the joint activity of ship owners, insurance agents, port and facility operators, naval forces, non-governmental, local, national and international organizations, local police, fire and harbour commissions and intelligence."<sup>113</sup> Integrating the efforts of such a wide range of agencies is, of course, a principal challenge confronting efforts to enhance maritime domain awareness. That effort, however, pales when confronted by the overall size of the industry itself. It is obvious that the complete elimination of security gaps and lapses is next to impossible in a system where there are so many access points.

Despite multilateral approaches, such as the Container Security Initiative (CSI) that was launched in 2002, only a fraction of ship borne containers is ever searched.<sup>114</sup> Cost, time and complexity work against the implementation of a universal inspection regime. Although Washington has contributed the most resources of any government to pursuing CSI objectives, complete coverage of containers entering the US remains out of reach. The situation has nonetheless improved since 2002 when only two percent of the containers entering the US were searched. US Customs and Border Protection estimate that less than one percent of maritime shipments that reached the US between 2009 and 2013 were considered high risk, demonstrating considerably greater surveillance than prior to the launch of CSI.<sup>115</sup> However, the passage of legislation in 2008 requiring that by 2014 all containers entering the US be searched has not yet been implemented, and many port authorities have warned Washington that it might never be affordable or technically achievable.<sup>116</sup> Overseas, CSI is impacted by other considerations. Many countries are

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<sup>111</sup> Hoovestal, *Globalization Contained*, p. 77.

<sup>112</sup> See, for example, Yaakov Katz and Yoaz Hendel, *Israel vs. Iran; The Long Shadow War* (Potomac Books: Washington, D.C., 2012), pp. 143–165.

<sup>113</sup> Joseph S. Szylowicz and Luca Zamparini, "Maritime Security: Issues and Challenges", in Bichou et al., *Maritime Transport Security: Issues, Challenges and National Policies*, p. 19.

<sup>114</sup> At present, 58 ports in 32 countries participate in CSI. A brief discussion of some of the problems related to CSI programmes can be found at Benjamin Hautecouverture, "The Container Security Initiative", *ONP N. 83 – Multilateral* (CESIM: Paris, 2012), [accessed on 21 February 2015 at [www.cesim.fr/observatoire/eng/83/article/165](http://www.cesim.fr/observatoire/eng/83/article/165)].

<sup>115</sup> Government Accountability Office, *Supply Chain Security – CBP Needs to Enhance its Guidance and Oversight of High Risk Maritime Cargo Shipments* (Washington, D.C., January 2015), p. 13.

<sup>116</sup> Joseph S. Szylowicz, "US Maritime Security Policy: Achievements and Challenges" in Bichou et. al., *Maritime Transport Security: Issues, Challenges and National Policies*, p. 119. In May 2012 and again in May 2014, the deadline was extended by two years citing "negative effects on trade capacity and the flow of cargo", as well as the characteristics of foreign ports "that prevent the installation of scanning systems." See General Accounting Office, *Maritime Security; Progress and Challenges with Selected Port Security Programs – Statement of Stephen L. Caldwell, Director, Homeland Security and Justice*, Washington, D.C., 4 June 2014, p. 17.

resentful of Washington's overall approach and view it as yet another example of US unilateralism, and a number have resisted efforts by US authorities to reassess the compliance of ports with CSI standards; some have refused to allow the deployment of US Coast Guard officials to monitor compliance with CSI objectives.<sup>117</sup> Even close allies and partners have proven reticent. Despite agreeing with the US on the need to improve maritime cargo security, the EU has cited cost concerns of implementing the type of regime Washington would like to put in place; and transatlantic cooperation in sharing information has been damaged by the revelations of mass US surveillance activities and data collection in Europe.<sup>118</sup>

In the absence of other multilateral arrangements, CSI nonetheless remains an important effort at improving maritime security and it will likely continue in the face of difficulties, even if the outcome is inevitably sub-optimal. This is because, in the worst case, failure could be catastrophic. A nuclear or a radiological dispersal device carried into a port within a container—what some have termed the nightmare scenario—would do enormous damage both to the surrounding landscape and population. More broadly, it would undermine confidence in the security of the global trading system itself, and few countries could insulate themselves from the economic reverberations. There have already been warnings. As early as 2004, US officials noted the acquisition by an unnamed Middle Eastern country of a ballistic missile system using containers, similar to the Russian-designed Club K, which would allow merchant ships to be used to launch deadly strikes.<sup>119</sup> Six years later, a container filled with scrap metal that arrived at the port of Genoa was found to contain a cylinder of Cobalt 60.<sup>120</sup> It is disquieting that, according to open sources, no one knows how the cobalt got into a container that originated in Saudi Arabia or how that container entered the transport system.<sup>121</sup>

The dependence of national economies on maritime transport has created significant new vulnerabilities. An increasingly globalised world has also created new concentrations of wealth and new investments in the successful management of the global trading system. Far from being an interest of only a few Powers, the sea lines of communication (SLOCs) have become truly global interests. As SLOCs are the major maritime routes between ports along which merchant shipping and naval vessels regularly travel, guarding their security is essential for the free flow of goods over the oceans. Maintaining free access to those SLOCs is a major concern of the navies of traditional maritime Powers.

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<sup>117</sup> Szyliowicz, "US Maritime Security Policy: Achievements and Challenges", in Bichou et al., *Maritime Transport Security: Issues, Challenges and National Policies*, pp. 126–131.

<sup>118</sup> Joshua P. Meltzer, *Testimony before the Subcommittee on Commerce, Manufacturing, and Trade and Subcommittee on Communications and Technology, United States House of Representatives*. Available at Brookings Institution, 3 November 2015 [accessed on 17 November 2015 at <http://www.brookings.edu/research/testimony/2015/11/03-eu-safe-harbor-decision-transatlantic-data-flows-meltzer>]. See also European Parliament, *EU-US Cooperation in Justice and Home Affairs – an overview* (European Parliamentary Research Service: Brussels, April 2016), p. 9.

<sup>119</sup> See the discussion on seaborne Scud missile threats in Institute for Foreign Policy Analysis, Independent Working Group on Missile Defense, *The Space Relationship & the Twenty-First Century* (Cambridge, Massachusetts, 2009), p. 7.

<sup>120</sup> Cobalt 60 is a radioactive isotope that could be used to produce a "dirty bomb". See Brian Clegg, *Armageddon Science – the Science of Mass Destruction* (St. Martin's Press: New York, 2010), pp. 88–89.

<sup>121</sup> Andrew Curry, "Why is this Cargo Container Emitting So Much Radiation?", *Wired*, 21 October 2011 [accessed on 21 September 2014 at [www.wired.com/2011/10/ff\\_radioactivecargo/all](http://www.wired.com/2011/10/ff_radioactivecargo/all)].

### **3.4.1 Chokepoints**

The existence of maritime chokepoints—the Strait of Gibraltar, the Straits of Malacca, Singapore, Bab al-Mandab, the Suez Canal, the Turkish Straits, the Straits of Hormuz, the Greenland-Iceland, United Kingdom (GIUK) Gap and the Panama Canal—has always been important in the strategic calculations of maritime Powers. Closures of such important waterways, however, have generally only ever happened in wartime when one combatant Power prevented another from using an important waterway (e.g., Gibraltar and the Suez Canal in the Second World War).<sup>122</sup> In the globalised world economy, such waterways have become ever more important for their contribution to shipping routes. Today, for example, 30 percent of all trade passes and 80 percent of all China's and Japan's oil imports move through the Straits of Malacca.<sup>123</sup> The viability of at least two of the largest economies is, therefore, dependent on unrestricted passage through a narrow channel of seawater.

The location of many of the chokepoints is a significant maritime consideration. Some are found in areas where political instability is the norm, or where the possibility of armed conflict is real. In the case of the Straits of Malacca, the waterway is relatively shallow that at some points requires regular dredging—with the consequence that natural or man-made obstruction is, if not likely, at least made easier should there ever be an intent to do so.<sup>124</sup> More generally, restricted or blocked access to any maritime chokepoint would impact the global economy, particularly with regard to the trade in energy resources.<sup>125</sup> Even the threat of a blockage can have a cascading impact on global markets, as happened in 2011 when Iran threatened to block the Straits of Hormuz to dissuade the EU from imposing economic sanctions.<sup>126</sup> Such an action would likely call forth a strong (perhaps an armed) response from the traditional maritime Powers, as well as a growing number of countries whose economies are dependent on maritime trade.

### **3.4.2 Ports as Hubs**

One author has written that “[b]ecause of their function and strategic locations, the viability and productiveness of ports can have a significant economic impact on their surrounding region.”<sup>127</sup> The largest ports have been transformed by globalisation into critical maritime infrastructure for the world economy. They have become hubs in a worldwide supply chain. One study of global ship movements noted in this regard that “[t]here are a few large, highly connected ports through which all smaller ports transact their trade.”<sup>128</sup> And the links might not be so obvious. More than 50 percent of the containers arriving in Montreal is coming to or leaving the US market; and much of what arrives in Prince Rupert, British Columbia, is destined for the US via the

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<sup>122</sup> Rodrigue, *The Geography of Transport Systems* (3<sup>rd</sup> ed), p. 32.

<sup>123</sup> Ray Griggs, “A Maritime School of Strategic Thought for Australia”, in Justin Jones (ed.), *A Maritime School of Strategic Thought for Australia* (SeaPower Centre: Canberra, Australia, 2013), p. 14.

<sup>124</sup> Rodrigue, *The Geography of Transport Systems* (3<sup>rd</sup> ed), p. 38.

<sup>125</sup> See Charles Emmerson and Paul Stevens, “Maritime Choke Points and the Global Energy System”, *Chatham House Briefing Paper*, January 2012.

<sup>126</sup> David Blair, “Iran threatens to close Strait of Hormuz over EU oil sanctions”, *The Daily Telegraph*, 23 January 2012.

<sup>127</sup> Michael C. Ircha, “Ports and Shipping Security”, *Proceedings*, 46<sup>th</sup> Canadian Transportation Research Forum, Gatineau, June 2011 [accessed on 17 July 2014 at

[www.ctrf.ca/conferences/2011Gatineau/2011Proceedings/11IrchaPortSecurity.pdf](http://www.ctrf.ca/conferences/2011Gatineau/2011Proceedings/11IrchaPortSecurity.pdf)], p. 2.

<sup>128</sup> Kaluza et al., “The complex network of global cargo ship movements”, p. 1095.

continental railway system.<sup>129</sup> The volume of traffic and the coordinating role of ports have together created the ideal environment within which illegal activity or the movement of illicit materials can take place. Any disruption to a single port—by violent actions, cyber-attacks, or by environmental and natural disasters—will have cascading effects, including an impact on regional and national socio-political stability.<sup>130</sup>

### 3.4.3 Foreign Flagging

The proliferation of flags of convenience (FOC), by which ships are registered in countries in which authorities do not exercise effective maritime management has become a serious problem for maritime security.<sup>131</sup> As a result of cost-competitiveness in the shipping industry, FOC offers ship owners a way to control rising operating costs while providing a lucrative source of revenue for some countries without any costly enforcement responsibilities. Consequently, it undercuts any effort to fashion a regulatory regime based on accountability. FOC also generates a distorted picture of the international shipping industry—and prevents liabilities from being correctly and most economically assigned (see Table 3). Foreign flagging offers cover for unscrupulous ship owners that, alongside safety and environmental concerns, pay little attention to the age, state of repair, and/or seaworthiness of their vessels.<sup>132</sup> More generally, FOC raises insurance rates and undermines the economic viability of the entire maritime transport system.<sup>133</sup>

*Table 3: Flags of Registration (top 10 countries by Deadweight Tonnage).*

Country	Number of vessels	Share of world total (%)	Deadweight tonnage (000's dwt)	National ownership (%)
Panama	8,580	9.87	350,506	0.14
Liberia	3,144	3.62	198,032	0.01
Marshall Islands	2,064	2.37	140,016	0.11
Hong Kong	2,221	2.55	128,806	12.15
Singapore	3,339	3.84	89,697	36.6
Greece	1,551	1.78	75,424	92.6
Bahamas	1,446	1.66	73,702	1.18
Malta	1,794	2.06	68,831	0.35
China	3,727	4.29	68,642	98.18
Cyprus	1,030	1.18	31,706	19.51

Source: United Nations Conference on Trade and Development (UNCTAD), *Review of Maritime Transport 2013*, p. 56.

<sup>129</sup> Ircha, “Ports and Shipping Security”, p. 3.

<sup>130</sup> Speller, *Understanding Naval Warfare*, p. 19.

<sup>131</sup> One study identified a 281 percent increase in tonnage of ships that are foreign flagged. Sharad Sinsunwal, “Navies and Security in the Global Commons”, *Maritime Affairs*, Vol. 8, No. 1, Summer 2012, p. 53.

<sup>132</sup> Rosen, *Challenges to Public Order and the Seas*, pp. 17–18.

<sup>133</sup> One study examined Lloyd’s casualty register and concluded that FOC’s do have a worse safety record. See T. Alderton and N. Winchester, “Flag states and safety: 1997-1999”, *Maritime Policy and Management*, Vol. 29, No. 2, 2002, pp. 151–162.

There is, moreover, a major security concern attached to the proliferation of FOC. Some small countries have allowed ships to be registered anonymously with the result that anything can be transported, facilitating the efforts of criminals and terrorists to take advantage of the freedom of the ocean commons. For example, there is speculation that al Qaeda and the Taliban used such vessels to smuggle heroin and hashish from Afghanistan; the funds that were raised were being used to support their global activities.<sup>134</sup> Despite a heightened awareness of risk, some maritime countries remain opposed to greater coastal state regulation of the ocean commons. Barring a paradigm changing event, effective regulation of FOC will continue to clash with a legitimate desire by governments to expand trading opportunities.

### 3.5 Organized Crime and Piracy

Trans-national criminal networks and terrorists are increasingly capitalising on the freedom of the ocean commons. Separately, each poses significant challenges to the maritime security interests of almost all coastal states. Loss of customs revenue, control over immigration (through human smuggling), and the illegal drug trade, directly threaten the ability of some governments to maintain order within their borders. When such groups combine their efforts, the challenge that governments face is exponentially increased.

For terrorist groups (including those that are state-sponsored), shipping can be a principal means by which they obtain arms and other supplies. Despite a UN arms embargo on Iran, Tehran regularly uses maritime means to transport weapons, including missiles, to its main proxy in the Middle East (Hezbollah) and thereby contributes to the region's general instability.<sup>135</sup> North Korea does much the same with the Gaza-based Hamas.<sup>136</sup> Accessibility to targets in foreign lands via the sea is a further vulnerability that terrorists have proven willing to exploit. The attacks on Mumbai (2008) and the failed attempts by Hamas to penetrate Israel by sea in mid-2014 are two such instances.<sup>137</sup>

Alongside the use of the maritime sphere to facilitate terrorist attacks, there is evidence of ties between terrorists and organized crime that rely on use of maritime transport. Working together, they have created a network for the movement by sea of illegal immigrants and for illicit trading that provides income and weapons for some jihadist groups.<sup>138</sup> Jihadist organizations, such as al Qaeda and the Islamic State (IS), are believed to be interested in maritime targets. A leaked

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<sup>134</sup> See Frank Shanty, *The Nexus: International Terrorism and Drug Trafficking from Afghanistan* (Praeger: New York, 2011), p. 186, fn 55, Benjamin Weiser, "Manhattan Jury Convicts Man Linked to Taliban Leader in Drug Smuggling Case," *New York Times*, 23 September 2008, "Drug money sustains al Qaeda", *The Washington Times*, 29 December 2003, and Gretchen Peters, *How Opium Profits the Taliban* (US Institute of Peace: Washington, D.C., 2009).

<sup>135</sup> Guy Taylor and Maggie Ybarra, "Despite sanctions relief, Iran aids Hamas with missile technology", *The Washington Times*, 18 August 2014.

<sup>136</sup> Victor Cha and Gabriel Sheinmann, "North Korea's Hamas Connection: 'Below' the Surface?", *The National Interest* (online), 4 September 2014.

<sup>137</sup> See Alan Cummings, "The Mumbai Attack: Terrorism from the Sea", *Centre for International Maritime Security online blog*, 29 July 2014 [accessed on 8 September 2014 at <http://cimsec.org/mumbai-attack-terrorism-sea/12280>] and "Hamas terrorists killed by IDF on Israel's Zikim beach", *Reuters*, 9 July 2014.

<sup>138</sup> See Richardson, *A Time Bomb for Global Trade*, p. 58 and 86 and Angela Veng Mei Leong, *The Disruption of International Organised Crime: An Analysis of Legal and Non-Legal Strategies* (Ashgate: London, 2013), pp. 22–23.

document from Russia's Federal Security Service (FSB) asserted that al Qaeda had created a 60-strong team to plant mines on ships and to launch suicide attacks on ships in the Mediterranean.<sup>139</sup> Terrorist attacks against naval targets have already taken place elsewhere. In September 2014, for example, a jihadist group attacked the Pakistani naval dockyard in Karachi.<sup>140</sup> While the attackers were overpowered, the incident recalls the bombing of the USS *Cole* in Yemen in 2000, and underscores the vulnerability of naval vessels in ports and surrounding waters where terrorist groups are active. But ships at sea are no less vulnerable. The ability to strike ships with shore-based weapons was demonstrated when, in mid-2016, an IS affiliate operating in Sinai launched a missile strike against an Egyptian naval vessel off that peninsula's Mediterranean coast.<sup>141</sup> Significantly, maritime terrorism also has the potential to have a strategic impact far out of proportion to the incident itself. Reports that the Indian Navy went on alert during the Karachi incident as a result of "unusual movements of Pakistani warships" underscores the danger that terrorist attacks can significantly escalate existing tensions in politically-sensitive regions.<sup>142</sup>

In recent years, there has been considerable attention paid to the threat to international shipping posed by piracy. It has been referred to as the scourge of the modern maritime realm, but there is nothing particularly new about the re-emergence of this phenomenon. Because of the danger they long posed to freedom of navigation and to trade, in the early-17<sup>th</sup> Century Hugo Grotius referred to pirates as *hostis humani generis* (tr. enemy of mankind) who could be dealt with using armed force, including by private individuals in the absence of public authority.<sup>143</sup> Despite the harsh antidote that he prescribed, piracy as an international maritime problem has persisted, although the fragility of some countries (e.g., Somalia), the weakness of government authority in some regions (e.g., Southeast Asia and West Africa), and the rise of militarized Islam have breathed new life into it.<sup>144</sup> Piracy reaches beyond those directly affected by such activities. It undermines the legitimacy of regimes by demonstrating their political impotence and by encouraging corruption, and it has the potential to trigger environmental disaster should an attack occur in "crowded sea lanes traversed by heavily-laden tankers."<sup>145</sup> Due to globalization, maritime choke points in politically unstable regions and the increase in the number of ships transiting the traditional SLOCs have increased the risk of such attacks.

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<sup>139</sup> Seumas Milne and Ewen MacAskill, "Al Qaida planning kamikaze attacks on ships in Mediterranean, cables claim", *The Guardian*, 25 February 2015.

<sup>140</sup> Syed Shoaib Hasan, Saeed Shah and Siobhan Gorman, "Al Qaeda Militants Tried to Seize Pakistan Navy Frigate", *The Wall Street Journal*, 16 September 2014, and Usmann Ansari, "Red Alert for Al-Qaeda Attacks on Shipping", *Warships – International Fleet Review*, December 2014, p. 4.

<sup>141</sup> "Egypt navy ship 'hit by Sinai militants' missile", *BBC News* (online), 16 July 2015.

<sup>142</sup> Suman Varadani, "Indian Navy Puts Warships on High Alert Following Karachi's Naval Dockyard Attack: Report", *International Business Times*, 10 October 2014 and "Terror alert for Kolkata port, Navy pulls out ships docked for display", *The Times of India*, 5 November 2014.

<sup>143</sup> See M. Kempe, "Beyond the Law: The Image of Piracy in the Legal Writings of Hugo Grotius", in H.W. Blom (ed.), *Property, Piracy and Punishment: Hugo Grotius on War and Booty in De Iure Praedae – Concepts and Contexts* (Brill: Leiden, 2009), pp. 379–395.

<sup>144</sup> One jurist has written that "[m]aritime piracy is a function of a lack of governance on land. Consequently, the most effective efforts to suppress piracy are shore-based political solutions." See James Kraska, *Contemporary Maritime Piracy – International Law, Strategy and Diplomacy at Sea* (Praeger: Santa Barbara, California, 2011), p. 2.

<sup>145</sup> Peter Chalk, *The Maritime Dimension of International Security: Terrorism, Piracy and Challenges for the United States* (RAND: Santa Monica, 2008), pp. 16–17.

In some regions, such as off the Horn of Africa, piracy is assessed to be “a self-sustaining, low-risk/high payoff proposition” that “as a result, pirate recruiting and the frequency of attacks will continue to grow.”<sup>146</sup> But because it, unlike terrorism, is a crime of opportunity, a strong constabulary-like response by various navies has often proven effective. Recent multilateral counter-piracy operations have proven remarkably successful as of late and the number of incidents at sea has decreased. Confronting pirates with armed force can, therefore, have a salutary effect. One author has even suggested that, in recent years, some pirates have remastered as anti-piracy consultants, as that career-change has proven very rewarding in light of the counter-piracy campaign.<sup>147</sup> Also, in some cases, the international response ultimately ends very badly for pirates, as happened in 2009 with the recapture of the SS *Maersk Alabama*. While there is demonstrable value in attacking symptoms, many experts nonetheless argue that the root causes ashore cannot be addressed without more extensive and sustained international engagement. Regardless of the programme that over time is implemented, naval forces will undoubtedly play a role either as the principal enforcement mechanism or as a security backstop.

Even at a much reduced level,<sup>148</sup> piracy will likely persist given that “the piracy business model has been highly successful” with large sums transferred to pirate groups to free hostages and ships. As one study noted, “it is a low cost activity that pays well.”<sup>149</sup> In 2011, it was estimated that US\$146 million in ransoms was paid; leading one analyst to write that it was the “second largest generator of money in Somalia.”<sup>150</sup> In that year, the aggregate cost of piracy to the global economy totalled about US\$7 billion.<sup>151</sup> The impact of such illicit activity can be widespread, in costs of lives, increased insurance rates on ships and cargo, the high-cost of hiring security contractors to guard against pirate attacks, the expense of re-routing of ships, and increased energy costs in order to out-distance would-be attacks. Additionally, there is the burden imposed on national governments that are required to deploy already stretched naval forces to protect cargo vessels and patrol shipping lanes.

While these implications might at first seem far removed from national economies, many of these increased costs are transferred to consumers in the form of higher prices. But the impact of piracy ought not to be exaggerated, for it cannot do long-term damage to the global economy, nor is it a

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<sup>146</sup> Gary E. Weir, “The answer may be on your Luncheon Plate: the Dilemma of Piracy in the Horn of Africa”, Andrew Forbes (ed.), *Papers in Australian Maritime Affairs*, No. 30: *Maritime Capacity Building in the Asia-Pacific Region* (Sea Power Centre: Canberra, 2010), p. 71.

<sup>147</sup> “The complicated world of money, war and politics in Somalia and South Sudan: Book Review of Alex de Waal, The Real Politics of the Horn of Africa: Money, War and the Business of Power”, *The Economist*, 17 October 2015, pp. 86–87.

<sup>148</sup> While it is assumed that the number of attacks has fallen, it is not certain how many are taking place as shipping companies and commercial ship owners prefer not to report such incidents. Higher insurance rates and the ability to point to a clean record probably dissuade many from reporting incidents of piracy. See Alec Coutroubis and George Kiorktsgoglou, “Maritime Piracy Analysis”, in Khalid Bichou, Joseph S. Szlyliowicz and Luca Zamparini (eds.), *Maritime Transport Security: Issues, Challenges and National Policies* (Edward Elgar: Cheltenham, UK, 2014), p.107.

<sup>149</sup> Martin Murphy, *Small Boats, Weak States, Dirty Money – Piracy and Maritime Terrorism in the Modern World* (Columbia University Press: New York, 2009), p. 23.

<sup>150</sup> James Brown, *Pirates and Privateers: Managing the Indian Oceans Private Security Boom*, Lowry Institute for International Policy, Sydney, September 2012, p. 4. See also Christopher Alessi and Stephanie Hanson, *Combating Maritime Piracy*, Council on Foreign Relations, New York, 23 March 2012 [accessed on 30 June 2014 at [www.cfr.org/piracy/combating-maritime-piracy/p18376](http://www.cfr.org/piracy/combating-maritime-piracy/p18376)].

<sup>151</sup> IMO, *International Shipping Facts and Figures*, Section 6.2.1.

globally proliferating activity. It can only take root in areas with a maritime tradition and the maritime skills necessary to engage in it. Trading patterns help determine where piracy is likely to occur because it is, as has already been noted, very much a crime of opportunity—the promise of reward; however that is defined, is the pirate's principal motive. Individual attacks can nonetheless be disruptive over the short-term, as happened in 2002 when a suicide attack on the tanker MV *Limburg* caused a temporary spike in global oil prices.<sup>152</sup>

### 3.6 Regulation and International Competition

During the past two centuries, states have increasingly asserted their control over the ocean commons. Today, much of the pressure to extend sovereign rights over the oceans comes from developing countries. However the impetus for this trend originally came from the US. Although today Washington is formally opposed to UNCLOS and continues to refuse to ratify the convention, it was the newly independent US that established a precedent when it declared a three-mile territorial sea over which it claimed the same rights it exercised on land. Very quickly all other littoral states (i.e., those in Europe) followed suit. By the mid-20<sup>th</sup> century, demands for enlargement of territorial seas were frequent, but efforts to reach international agreement failed. States unilaterally adjusted their claims, so that by the time of UNCLOS (1982), the three mile limit had been replaced as the international standard by the 12 mile territorial sea. Pressure for even greater state control over the ocean commons nonetheless persisted. It, too, found expression in President Harry Truman's September 1945 proclamation asserting "jurisdiction over all natural resources of the subsoil and seabed" of the US continental shelf, the demand by governments for greater national control over ocean space has grown.<sup>153</sup> That declaration was to later inform the international legal recognition of EEZs through UNCLOS.

As an international accord, UNCLOS represents the most comprehensive effort to resolve the tensions that have arisen between the traditional emphasis on the oceans as a commons and those countries who advocate greater state authority. Despite the benefits it provides to the international system, it also provides governments with what they claim to be international legal authority to challenge the longstanding view of the oceans as a commons. By enshrining the concept of EEZs, UNCLOS has given littoral states a much larger ocean space over which to exercise their jurisdiction. This means that 35 percent of the world's oceans are now enclosed within the jurisdiction of national governments and a large proportion of the oceans' resources have been assigned to coastal states (see Figure 7).

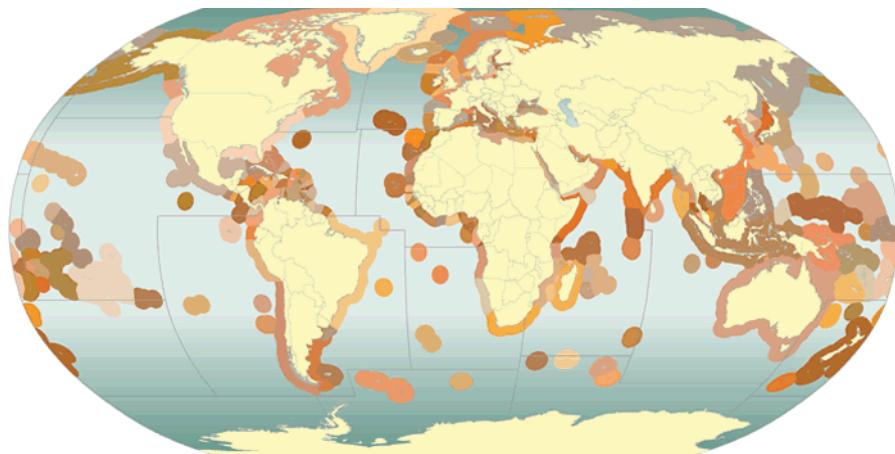
UNCLOS has also generated a momentum in which a further extension of state control seems very probable. The convention contains a provision (Article 76) by which states can extend their EEZs beyond 200 nautical miles until the end of the continental margin, provided that this extension does not extend more than 350 miles beyond the coastline or 100 miles beyond the 2500-meter isobaths. By mid-December 2014, 77 submissions requesting international recognition of a variety of such claims had been made to the UN Commission on the Limits of the Continental Shelf. Considering these submissions will require careful adjudication in some cases, particularly where claims overlap and one can assume that, in some cases, international frictions

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<sup>152</sup> Chalk, *The Maritime Dimension of International Security*, pp. 24–25.

<sup>153</sup> *Proclamation 2667 of September 28, 1945 – Policy of the United States with Respect to the Natural Resources of the Subsoil and Seabed of the Continental Shelf* [accessed on 7 January 2015 at [www.gc.noaa.gov/documents/gcil\\_proc\\_2667.pdf](http://www.gc.noaa.gov/documents/gcil_proc_2667.pdf)].

will not be reduced by decisions of the Commission. Nevertheless, by creating a greater opportunity for governments in the development of ocean resources beyond their territorial waters, UNCLOS has inadvertently intensified ocean politics by exacerbating some maritime boundary disputes. In the eastern Mediterranean, the South China Sea, and in the south Atlantic (i.e., the Falkland Islands), UNCLOS has helped foster situations where historical enmities and longstanding territorial ambitions are now inflamed by more recent resource development claims, with the latter fuelled (justly or not) by an appeal to international law. That combination exacerbates disputes that have already proven resistant to resolution through negotiation.



**Figure 7: Ocean Space within Exclusive Economic Zones Source.**

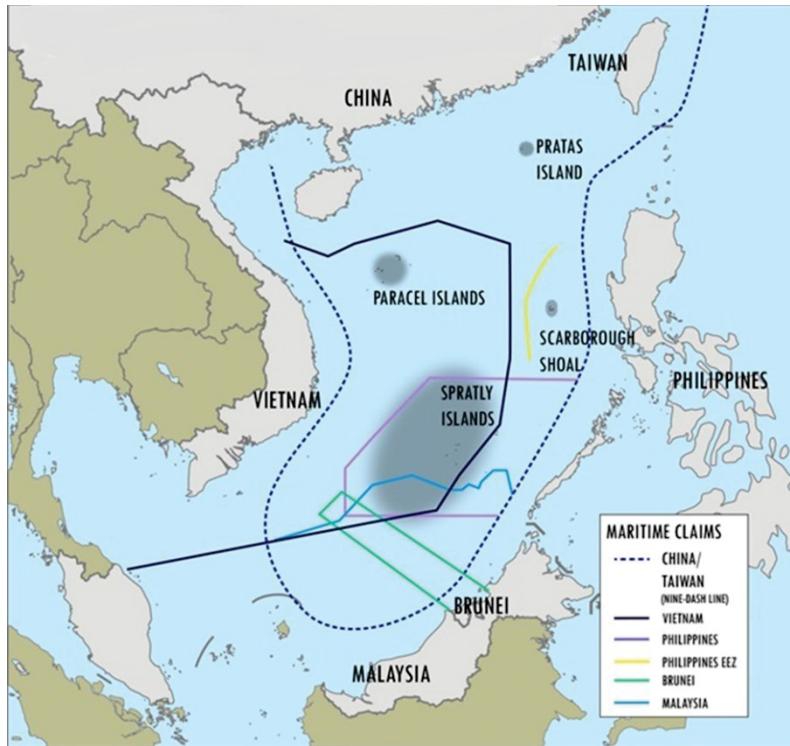
Source: SeaAroundus.com (public domain).

Regardless of the intent of the Convention, a number of states have become more assertive in the larger ocean space (i.e., EEZ) that that accord has given them rights over; and, conversely, they have sought to reduce those of the broader international community. Some countries' claims, particularly in Asian waters (e.g., the South China Sea), have created instability and insecurity among regional governments (see Figure 8). Three rising Powers—Brazil, India and China—have sought to restrict foreign military activities, including the right of innocent passage, in their EEZs by arguing that such actions are either threatening or pose environmental hazards.<sup>154</sup> Given that one of the challengers is China, a near-peer competitor of the US with the world's second largest economy, there are fears that its actions might encourage other countries to act similarly.<sup>155</sup>

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<sup>154</sup> James Kraska, *Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics* (Oxford University Press, 2011), p. 9.

<sup>155</sup> Mark E. Rosen, *Challenges to Public Order and the Seas* (Center for Naval Analysis: Alexandria, Virginia, March 2014), pp. 14–15.



**Figure 8: Maritime Boundary Claims in the South China Sea.**

Source: Jeffrey Bader, Kenneth Lieberthal and Michael McDevitt, "Keeping the South China Sea in Perspective," *Foreign Policy Brief* (Brookings Institution: Washington, D.C., August 2014), p. 2. Copyrighted. Used with permission.

The unilateral interpretation of UNCLOS is a direct threat to both customary international law and the traditional principle of freedom of the seas. Frictions will continue to emerge when traditional maritime Powers (principally the Western democracies) resist what is viewed as a ploy to extend the reach of territorial waters that was never intended by UNCLOS. The US, in particular, has declared the preservation of the open seas to be a core interest and frequently uses its navy to assert transit rights in both recognised and disputed EEZs, as well as in waters that it believes are international waters.<sup>156</sup> In some cases, this has resulted in armed clashes such as that between the US and Libya over the Gulf of Sidra (1986), and has so far led to significantly heightened rhetoric from China when the USN has conducted freedom of navigation operations (FONOPS) in the South China Sea. So far, China has avoided military confrontations and has instead relied upon coast guard patrol and fishing vessels to harass foreign naval vessels transiting through waters that it claims.<sup>157</sup> In May 2014, for example, China moved an oil rig into Vietnam's

<sup>156</sup> Ralf Emmers, *The US rebalancing strategy: The impact on the South China Sea* (National Security College: Canberra, 2012), p. 41.

<sup>157</sup> Kraska, *Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics*, p. 12. In 2009, Chinese patrol ships and aircraft harassed the USNS *Bowditch* (March 2001), the USNS *Impeccable* (March 2009), and the USNS *Victorious* (May 2009) that were conducting survey and ocean surveillance in international waters south off Hainan Island. In April 2001, a US Navy EP-3 electronic surveillance aircraft flying in international airspace was intercepted and forced to land. See Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities – Background and Issues for Congress* (Congressional Research Service: Washington, 23 March 2012), pp. 6–7.

EEZ and protected it by using more than 80 ships, including seven military vessels, 33 surveillance ships and fishing vessels.<sup>158</sup> Beijing's use of non-military assets avoids immediate escalation that might ensue were naval forces directly involved. However, the political implications of Chinese activity are much the same, a fact not lost on local governments and so the potential for conflict remains high. More recent still, Beijing has pursued a policy of building islands in the South China Sea, almost certainly to increase the ocean space that it will claim lies within its EEZ<sup>159</sup>—yet another imaginative manipulation of UNCLOS.

The clash between preserving traditional liberties on the high seas that are necessary for the global trading system and for power projection by naval Powers, and the claims of those states that would restrict such access, will influence ocean politics in the 21<sup>st</sup> Century. Some of the rising Powers in the Indo-Pacific, most notably China, “articulate a fundamentally different interpretation of international maritime law” and so a universal understanding of what UNCLOS mandates is already under siege.<sup>160</sup> The ensuing frictions will continue and the outcome is not easily predictable. In the case of China, for example, Beijing categorically rejects third-party or multilateral mechanisms to resolve maritime boundary disputes, preferring bilateral approaches where it believes it can impose a settlement.<sup>161</sup> Many of these disputes such as in the South China and Yellow seas are therefore pregnant with the possibility of military escalation. Perhaps most disturbingly, the challenge by governments to the traditional idea of a global commons sometimes draws upon domestic popular support further restricting the room for negotiations.<sup>162</sup>

### 3.7 The Impact of Climate Change

Trends identified by scientists over the past fifty years reveal that most of the increase in temperature associated with global warming has occurred in the oceans, with smaller contributions from melting sea and land ice.<sup>163</sup> Warmer currents that dissipate about 50 percent of the excess heat associated with global warming are carrying that heat to the polar regions.<sup>164</sup> In some areas of the Arctic, it is believed that climatic conditions are changing faster than at any time in the past 10,000 years.<sup>165</sup> Marine life has survived large climate change in the past, and it is

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<sup>158</sup> “Vietnam - Navy”, *Jane’s Security Sentinel Assessment* (online), 5 March 2015 and Wendell Minnick, “Fishing Vessels in China Serve as Proxy Enforcers”, *Defense News*, 18 August 2014.

<sup>159</sup> Tom Philips, “China building a ‘Great Wall of Sand’ in South China Sea is ‘provocative’”, *The Daily Telegraph*, 1 April 2015.

<sup>160</sup> Timo Behr, Mika Aaltola and Erik Brattberg, “Maritime Security in a Multipolar World: Towards an EU Strategy for the Maritime Commons”, *FIIA Briefing Paper 130*, Stockholm, May 2013, p. 8.

<sup>161</sup> For example, China has declined to participate in a case in the Permanent Court of Arbitration brought against them by the Philippines. Toby Sterling, “Court begins hearing Philippines, China dispute over South China Sea”, *BBC News*, 8 July 2015.

<sup>162</sup> See Kraska, *Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics*, p. 23. When Hanoi opposed Beijing’s efforts in May 2013 to deploy an oil rig in disputed waters of the South China Sea, anti-Chinese riots erupted in Vietnam. Vu Trong Khanh and Nguyen Anh Thu, “Vietnam, India to Expand Oil Exploration in Contested South China Sea”, *The Wall Street Journal*, 15 September 2014.

<sup>163</sup> S.C. Doney, L. Bopp and M.C. Long, “Historical and future trends in ocean climate and biochemistry”, *Oceanography*, Vol. 27, No. 1, March 2014, p. 108.

<sup>164</sup> Stephen A. Macko, “Global Ocean Challenges”. in Nordquist et al., *Freedom of Navigation and Globalization*, p. 307.

<sup>165</sup> Stephen A. Macko, “Global Ocean Challenges”, in Nordquist et al., *Freedom of Navigation and Globalization*, p. 304.

continually adjusting to what is happening today. Scientists remain concerned, however, that the unprecedented pace of temperature change now occurring will not permit species to adapt rapidly enough, with the result that global marine biodiversity will suffer.<sup>166</sup> Were that to happen, the living resources that humans harvest from the oceans, as well as the sustainability of marine ecosystems more generally, would be impacted.

If current trends persist, climate change will also directly impact human populations in the form of more severe and more frequent droughts, storms and floods. Thermal expansion, as a result of global warming, “is causing higher sea levels, and even more important, increasing the frequency and strength of extreme weather events such as tropical cyclones or hurricanes.”<sup>167</sup> Over time, this will be particularly important in low-lying regions of southern Asia (especially Bangladesh) and some areas of Africa, as well as many smaller island countries in the Indian and Pacific oceans. The impact will not be equally severe everywhere. The FAO has determined that climate change will have “a disproportionately negative impact on the economics and livelihoods of nations and communities in Asia.”<sup>168</sup> This is hardly surprising as seven of 10 countries assessed by the UN to be most likely to be affected are found there.<sup>169</sup>

While populations will bear the brunt of climate change, there will also likely be larger political and geostrategic implications. *Quadrennial Defense Review 2010* (QDR 2010) prepared by the US Department of Defense underscored the assessment that “climate change could have significant geopolitical impacts around the world.”<sup>170</sup> Rising sea-levels and the displacement of populations, “particularly in those rapidly expanding cities in developing countries where governance is weak”, were also identified in a recent study, *Global Strategic Trends*, prepared by the UK’s Ministry of Defence.<sup>171</sup> Four years later in *Quadrennial Defense Review 2014* (QDR 2014), the effects of climate change are identified as “threat multipliers that will aggravate stressors [sic] abroad, such as poverty, environmental degradation, political instability and social tensions—conditions that can enable terrorist activity and other forms of violence.”<sup>172</sup>

The global economy could also suffer, due largely to its reliance on seaborne transport. Erratic weather will complicate maritime shipping schedules. The uncertainty that will arise from such a disruption to existing trade patterns could upset the production and distribution of international goods and services. Some countries will naturally be more affected than others, as productivity (e.g., in the agricultural sector) is impacted and supply chains are affected. New shipping routes will result in added costs and new security risks (and quite possibly conflicts) over

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<sup>166</sup> Doney et al., “Historical and future trends in ocean climate and biochemistry”, p. 116.

<sup>167</sup> Lora E. Fleming and Edward Laws, “Overview of the Oceans and Human Health”, *Oceanography*, Vol. 19, No. 2, June 2006, p. 19.

<sup>168</sup> Droughts and increased food costs leading to rising imports of staples are already happening, such as in the Philippines and Vietnam, and an estimated 30 million people have been displaced “by environment and weather-related disasters in the region.” To choose a single example, Singapore, one of the region’s wealthiest actors, is already deeply concerned. Coastal erosion, loss of land area, as well as fresh water scarcity have all been identified as possible future challenges that the small city-state will be forced to confront. It is noteworthy that less affluent countries will not have the resources Singapore can call upon to attempt to address such problems. See Barthal-Datta, “Food Security in Asia: Challenges, Policies and Implications”, pp. 116–118.

<sup>169</sup> Barthal-Datta, “Food Security in Asia: Challenges, Policies and Implications”, p. 119.

<sup>170</sup> Department of Defense, *Quadrennial Defense Review 2010* (Washington, D.C., 2010), p. 85.

<sup>171</sup> *Global Strategic Trends – Out to 2045*, p. 33.

<sup>172</sup> Department of Defense, *Quadrennial Defense Review 2014* (Washington, D.C., 2014), p. 8.

access.<sup>173</sup> They will also alter the importance of existing ports and the trading networks they serve, leading to regional economic distress and population dislocation, as countries try to adjust. Ports, in particular, are assessed as being vulnerable to the sorts of weather conditions that climate change portends. According to a UN report prepared in 2011, increasingly violent weather will confront seaports with accelerated coastal erosion, port and coastal road flooding (and associated implications for trade with surrounding areas), an increased requirement for dredging, and likely damage to the structural integrity of infrastructure.<sup>174</sup> This vulnerability will be increased for those in low-lying island areas or on deltas in developing regions where adaptive capacity will undoubtedly be limited.<sup>175</sup> Perhaps most frightening is the possibility, as a joint report by the United Nations and the World Trade Organisation notes, that too great a disruption will also undermine the ability of societies to use trade (and comparative advantage) to adapt to the changing economic conditions brought about by an altered climate.<sup>176</sup>

It is important to acknowledge that, as in any crisis, there will also be opportunities. It is therefore conceivable that the impact of climate change could be positive for some countries. The opening of the Arctic region to shipping as a result of reduced ice coverage offers the possibility of new commercial routes that would reduce the length of sea voyages and, as a consequence, expense. This is of particular interest to trading states, such as China and South Korea, whose economies are heavily dependent on overseas trade. Expanded exploitation of natural resources, especially oil and gas, in that heretofore inaccessible region would also benefit the global economy. Regardless of a precise cost-benefit analysis, any appreciation of the likely consequences of climate change urge recognition that they will likely be both considerable and enormously expensive. Greater study is warranted, for as a UN agency stated, our knowledge of the risks to the international maritime trading system as a result of climate change suffers from significant gaps in the “specific nature and extent of exposure” to what many scientists believe is coming.<sup>177</sup>

Alongside the global trading system, navies will also confront specific challenges arising from climate change. As QDR 2014 notes, it “may increase the frequency, scale and complexity of future missions, including defence support to civil authorities...”<sup>178</sup> Should governments determine to respond to such catastrophes, the increased demand for HADR resources will strain both naval transportation and afloat support, as well as any relevant joint force structures.<sup>179</sup> Consequently, climate change could see a reduction in the ability of some navies to respond effectively to requirements for international assistance. At the same time, however, other states will inevitably sense opportunities in providing HADR. They will seize the chance to showcase new capabilities to build new bilateral relationships and advance aspirations for global leadership.

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<sup>173</sup> Sloggett, *The Anarchic Sea*, p. 11.

<sup>174</sup> UNCTAD, *Ad Hoc Expert Meeting on Climate Change Impacts and Adaptation: A Challenge for Global Ports*, Geneva, 28 September 2011, p. 5.

<sup>175</sup> Joint United Nations Economic Commission for Europe/United Nations Conference on Trade and Development Workshop, *Climate Change Impacts on International Transport Networks*, ECE/TRANS/WP.5/2010/3, Geneva, 29 June 2010, p. 5.

<sup>176</sup> United Nations Environment Program and the World Trade Organisation, *Trade and Climate Change*, Geneva, 2009, p. 62.

<sup>177</sup> UNCTAD, *Ad Hoc Expert Meeting on Climate Change Impacts and Adaptation*, p. 8.

<sup>178</sup> *Quadrennial Defense Review 2014*, p. vi.

<sup>179</sup> See Committee on National Security Implications of Climate Change for U.S. Naval Forces, Naval Studies Board, *National Security Implications of Climate Change for U.S. Naval Forces* (The National Academies Press: Washington, D.C., 2011), pp. 36–37.

## 4 Geopolitical Challenges

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The future maritime operating environment can never be immune from the influence of geopolitical developments. In identifying the most significant of those, *Future Security Environment, 2013-2040*, prepared by Canada's Department of National Defence, asserts that “economic power is more diffuse than in recent decades and (...) the increasing diplomatic and military power available to rising regional powers suggests a trend towards a more multipolar international system.”<sup>180</sup> This transformation suggests a multipolar system is emerging in which several Great Powers will struggle to establish “a balance between cooperation and competition, especially in the areas of economics and security.”<sup>181</sup> The *Global Trends 2030* report by the National Intelligence Council captured this dynamic and the direction it is giving to global affairs by observing that “Pax Americana is winding down.”<sup>182</sup> We are, therefore, living in an era of strategic uncertainty characterised by geo-strategic transformation. Wars and conflicts often accompany the systemic change that is now underway. Trends suggest that the probability of systemic war among the major Powers has declined, and there are a scale of activities in which armed forces are involved that lie between peace and war, but as historian Niall Ferguson has written, “like divorces, major shifts in the balance of power are seldom amicable.”<sup>183</sup> Therefore, what the ongoing changes mean for the future of international politics is not at all clear.

### 4.1 The Rise of the Indo-Pacific

The diffusion of power in the international system is most evident in the rise during the past two decades of Asia, specifically the Indo-Pacific, and is represented by that vast region’s increased economic wealth and concentration of enormously augmented military capabilities. This shift in the global balance of power is epochal. It is a signal that five centuries of Western domination of international politics are coming to an end. Projections of Asia’s future economic prowess are particularly impressive in this regard. A recent private sector study concluded that the purchasing power of Asian economies will increase eight-fold by 2030 as compared to only three-fold in OECD countries.<sup>184</sup> Should present trends continue, India will have the largest population, China will be the largest national economy by 2030, contributing an estimated 20 percent of global GDP (or slightly more than the US share), and two of the three largest economies will be Asian (India and China).<sup>185</sup> Just as interesting, of course, is the relative decline of the economic ranking of the traditional liberal democracies. The geography of global trade reveals that the G7 countries still account for half of global trade, but a growing share involves the developing economies in Asia with China absorbing the largest portion in both absolute and relative terms.<sup>186</sup> As one study has

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<sup>180</sup> Chief of Force Development, *Future Security Environment, 2013-2040* (Department of National Defence: Ottawa, 2013). p. 2.

<sup>181</sup> Dick Bedford, “The Changing Security Environment”, Scott Jasper (ed.), *Securing Freedom in the Global Commons* (Stanford University Press: Stanford, California, 2010), p. 35.

<sup>182</sup> The report is quoted in Evan Braden Montgomery, “Contested Primacy in the Western Pacific: China’s Rise and the Future of U.S. Power Projection”, *International Security*, Vol. 38, No. 4, Spring 2014, p. 121

<sup>183</sup> Niall Ferguson, “The trillion dollar question: China or America?”, *The Daily Telegraph*, 1 June 2009.

<sup>184</sup> Lloyd’s Register Group et. al., *Global Marine Trends, 2030* (London: 2013), p. 27.

<sup>185</sup> Lloyd’s Register Group et. al., *Global Marine Trends, 2030*, p. 25.

<sup>186</sup> Rodrigue, *The Geography of Transport Systems* (3<sup>rd</sup> ed), p. 163.

recently noted, “[e]conomic growth taking place in East and Southeast Asia has been one of the most significant force-shaping changes in the contemporary commercial environment”.<sup>187</sup>

In this new constellation of Powers, the challenges facing the oceans as a global commons will be most pronounced in Asia in coming decades; and because of the shifting balance of power that means that they will be highly relevant in their potential strategic impact. “[S]tarting in the last phase of the Cold War,” journalist Robert Kaplan has written, “the demographic, economic, and military axis of the earth has measurably shifted to the opposite end of Eurasia, where the spaces between the principal nodes of population are overwhelmingly maritime.”<sup>188</sup> Newly affluent societies in Asia will demand increased levels of consumer goods and will lead energy dependent lifestyles. It is expected that urbanisation will take place on a scale never seen before in low- to medium-income countries throughout the region, and this will need a vast range of materiel for construction of new city environments.<sup>189</sup> The increased requirement for food, energy, consumer goods and raw materials to build necessary social infrastructure will result in a growing demand for commercial shipping, including an expected growth in the number of large container ships transiting Asian waters.<sup>190</sup> Intra-regional trade, already comprising 53 percent of all Asian trade, is also likely to intensify, possibly leading to greater levels of political and economic integration, but certainly putting new strains on existing maritime trade routes.<sup>191</sup> But even more likely and more unsettling is that national ambitions could become more pronounced as states and societies become wealthier and have greater resources to pursue new opportunities and objectives. Longstanding animosities and/or rivalries could dangerously inflate clashing interests among increasingly affluent and self-confident regional governments.

To comprehend the strategic implications of what is happening, economic developments cannot be considered in isolation from geography. The most distinguishing geostrategic features are the predominance of waters and its immense size. Unlike Europe, that was the focus of Great Power competition for much of the previous two centuries, geography poses a different type of challenge for South and East Asia for it involves many thousands of miles. More telling still, a principal player in the region’s strategic affairs, the United States, looking across the Pacific, is located more than 6,000 miles away from the Asian mainland. Equally important, the chain of islands that runs from Russia’s Kuriles to the southern tip of New Zealand, act as a barrier to incursion from the Western Pacific, but also offer a means of controlling (or at the very least effectively monitoring) access to that ocean.<sup>192</sup> As a consequence, and unlike Europe, with the exception of

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<sup>187</sup> Rodrigue, *The Geography of Transport Systems* (3<sup>rd</sup> ed), p. 19. The rise of the Asian economies is mirrored by the relative decline in those of the West. According to a February 2015 report prepared by Price Waterhouse Coopers, a global business consulting firm, the number of Western countries in a list of the 10 largest national economies is expected to decline from four (the US, Germany, France and the UK) in 2014, to three (the US, Germany and the UK) in 2030, to two (the US and Germany) in 2050. Price Waterhouse Coopers, *The World in 2050: Will the shift in global economic power continue?* (February 2015), [accessed on 5 March 2015 at <http://monitor.icef.com/2015/03/global-economic-power-projected-shift-asia-emerging-economies-2050/>] p. 4.

<sup>188</sup> Robert Kaplan, *Asia’s Cauldron: The South China Sea and the End of a Stable Pacific* (Random House: New York, 2015).

<sup>189</sup> Lloyd’s Register Group et al., *Global Marine Trends, 2030*, p. 51.

<sup>190</sup> Lloyd’s Register Group et al., *Global Marine Trends, 2030*, p. 26.

<sup>191</sup> Jones, “Introduction” in Jones (ed.), *A Maritime School of Strategic Thought for Australia*, p. 5.

<sup>192</sup> Roy Kamphausen, “Asia as a Warfighting Environment”, in Thomas G. Mahnken and Dan Blumenthal (eds.), *Strategy in Asia: The Past, Present and Future of Regional Security* (Stanford University Press: 2014), pp. 16–19.

the Sino-Indian and the Sino-Russian borders, the land boundaries of the majority of regional Powers are not contiguous. While recognising that in today's world, air- and sea-power cannot be considered separately, it is important to acknowledge that the Indo-Pacific is a maritime strategic environment. As Robert Kaplan poignantly notes, "Europe is a landscape; East Asia a seascape."<sup>193</sup>

Much of the discussion about the rise of Asia orbits the re-emergence of China, a potential peer competitor of the US globally and very clearly an aspiring regional hegemon. With economic, political and diplomatic interests that span the globe, Beijing has become, as one study noted, "a fulcrum of change in the regional order."<sup>194</sup> With its increasingly assertive policies, backed by growing defence capabilities, the new China has unsettled the entire region, a situation that is magnified by a lack of transparency regarding its ambitions. Many of the countries in China's strategic periphery, including India, Japan and Russia, all of which have smaller economies and armed forces, are deeply concerned by the rapid transformation in China's status. Few countries in history have been so radically transformed in such a short space of time, and the speed with which new asymmetries have emerged has unsettled longstanding assumptions about regional affairs. These uncertainties in Asia are magnified by the relative decline in US power that raises troubling questions for some governments about Washington's willingness and ability to continue to project sufficient power to maintain the status quo.

The Indo-Pacific obviously includes, however, more than the East Asian archipelago, and the presence of other Powers with their own national ambitions contributes to the strategic uncertainty that now characterises international politics in Asia. Having long ignored Asia as a pillar of its foreign policy, Russia knows that its survival as a major Power requires it to play a more active role in the region or risk marginalization. Anxiously trying to build closer relationships with Asian governments, Moscow is determined not to fall further behind either Beijing or Washington in their efforts to exercise regional leadership. A lingering dispute with Japan over the Kuriles and the ongoing war in Ukraine have reduced, however, the attractiveness of Russia for many Asian investors and governments.<sup>195</sup> Beyond providing access to its vast natural resources, often at the cost of larger strategic interests, Russia has very limited means to project power. Its military and naval capabilities are much diminished from those of the Soviet era, and it lacks the capacity to play a stabilising role in regional security. The confrontation with the West, and the unwillingness of the current regime to enact substantive economic reforms, means that building up its military profile in Asian waters will prove very challenging. Doing so will demand sacrifices from the Russian people that might not be sustainable.

Russia's Asian policy is heavily influenced by domestic concerns—namely a regime eager to manage the economic impact of Western sanctions alongside the need to protect its eastern territories of Siberia and the Far East that are susceptible to economic and demographic pressure from China.<sup>196</sup> With few other viable options, Russia has become dependent on its relationship with China, especially as a market for energy exports that are a major source of government

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<sup>193</sup> Kaplan, *Asia's Cauldron. The South China Sea and the End of a Stable Pacific*, p. 5.

<sup>194</sup> Evan S. Mederios, *China's International Behavior: Activism, Opportunism and Diversification* (RAND: Santa Monica, 2009), p. 1.

<sup>195</sup> Morena Skalamera, "Putin's Asia Strategy for 2015", *Commentary* (National Bureau of Asian Research: Washington, D.C., December 2016), pp. 1–2.

<sup>196</sup> Margarete Klein, *Russia: A Euro-Pacific Power?* (Stiftung für Wissenschaft und Politik: Berlin, September 2014), p. 9.

revenue. Despite improvements in Sino-Russian affairs and intensifying defence cooperation, what some have called “Putin’s pivot”, Moscow’s expectation that closer relations with Beijing would enhance its global profile have largely come to naught. The relationship remains lop-sided as China views Russia as little more than a junior partner.<sup>197</sup>

West of the East Asian archipelago lies the vast expanse of the Indian Ocean. And there, too, is found a country like China whose aspirations have grown as its international presence has increased. Maritime considerations are becoming more important in India’s strategic outlook. Although it has traditionally had a ‘continentalist’ outlook, new appreciations of the strategic importance of the oceans and of sea power are now evident in New Dehli, informed as they are by the Indian Ocean role as the major waterway linking Europe and East Asia. A recent work on Indian foreign policy argues that it is the Indian Navy “that is carrying India’s standard forward internationally in an ever wider radius.”<sup>198</sup> Dehli’s naval forces have been effective in garnering support at home for an expanded international presence (by means of “showing the flag” and defence diplomacy) and they have also enhanced the country’s profile through such actions as the 2004–05 Tsunami relief effort and counter-piracy operations off the coast of Aden.<sup>199</sup>

For India, the rise of China is having an impact on strategic thinking, particularly so as Beijing continues to expand its influence (and attempts to build strategic leverage) in the Indian Ocean region that Dehli considers its sphere of influence. Perhaps because of its geography and the history of its relations with Beijing, India has deliberately sought to avoid a policy of confrontation. This approach continues to be followed despite China’s activities that have included the construction of deep water port facilities in countries that border India (Pakistan, Sri Lanka and Bangladesh). India has itself invested time and resources in building new relationships with countries along the Indian Ocean littoral, as well as with various East Asian governments including new navy-to-navy contacts and exercises with other navies further afield, and with Japan, South Korea and Vietnam.<sup>200</sup> Without fanfare, India has also signalled a willingness to more directly counter the growing Chinese presence in the Indian Ocean. It has increased the naval assets assigned to the Nicobar Islands that command the entrance to the Straits of Malacca through which much of China’s sea-based oil imports pass.<sup>201</sup>

India’s new international activism is both a reflection of, and a contribution to, the integration of the India Ocean in East Asian affairs, creating what is in essence a single strategic region. This development has implications for globalization with its emphasis on ever-expanding seaborne trade. Many of the most important SLOCs pass through the Indian Ocean into the East Asian archipelago (see Figure 9). Control of such bodies of water, such as the Straits of Malacca and the South China Sea, confers strategic advantage. Even larger than the Mediterranean, the South China Sea is rapidly becoming another such body of water. Indeed, it will very likely be the strategic lynchpin for the Indo-Pacific region. As well as the enormous riches below its surface that alone confers on it political importance, this sea is an important maritime corridor. In addition to interdicting the otherwise free flow of seaborne trade through its waters, any state

<sup>197</sup> “Looking East: Russia is Shifting Priorities to the Pacific and Forging New Alliances, But Will They Last?”, *Asia-Pacific Defense Forum*, Vol. 40, No. 1, 2015, pp. 36–39.

<sup>198</sup> David M. Malone, *Does the Elephant Dance? Contemporary Indian Foreign Policy* (Oxford University Press: 2011), p. 9.

<sup>199</sup> David Brewster, *India as an Asia-Pacific Power* (Routledge: London, 2012), pp. 10–11.

<sup>200</sup> Brewster, *India as an Asia-Pacific Power*, pp. 137–152.

<sup>201</sup> Brewster, *India as an Asia-Pacific Power*, p. 135.

acquiring effective control over the South China Sea would require a challenger to attempt power projection from a much greater range. It is for these reasons—resources, trade and power—that so many countries are determined to protect their interests in this sea.<sup>202</sup>



**Figure 9: Major Sea Lines of Communication in Asia.**

Source: Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China* (Washington, D.C., 2009), p. 4.

<sup>202</sup> James R. Holmes, “Mahan and the South China Sea”, in Mahnken and Blumenthal (eds.), *Strategy in Asia: The Past, Present and Future of Regional Security*, pp. 61–72.

**Table 4: Overview of Major Indo-Pacific Navies and Coast Guards.**

	China	India	South Korea	Japan	Indonesia	Taiwan	Vietnam	Australia
Navy	255,000	54,700	41,000	45,500	44,000	46,500	17,000	14,400
[Reserves]			[9,000]	[1,100]		[60,000]		[8,300]
Marines	10,000	2,000	27,000		20,000	15,000	27,000	
Submarines (SSBNs)	5 <sup>203</sup>	X <sup>204</sup>						
Submarines (SSNs)	5	1						
Submarines (SSKs)	53	13	12	16	2	2	3	6
Aircraft Carrier	1	2						
Helicopter Carrier				2				
Destroyers	19	8	12	41		4		
Frigates	49	15	10	6	6	22	7	12
Fast Attack - Missile	86		75		12	43	14	
Patrol Craft	119	29	15	6	47	8	34	14
Corvettes	8	24	25		22		8	
LPDs & LHDs	3	1	1	3	5			3
MCMs	40	8	3	25	9	12	13	6
Coast Guard	n.a. <sup>205</sup>	9,200	4,500	12,650	n.a.	17,000	n.a.	n.a.
Offshore Patrol Boats (>1,500 tonnes)	22	12	5	39	6	7	1	1
Coastal Patrol Boats	58	36	36	54	5	14	5	11
Patrol Boats	504+	37	9	296	125	117	28	

Source: *Jane's Fighting Ships 2014-2015*. The data on coast guards is taken from International Institute of Strategic Studies, *The Military Balance 2014* (London, February 2014).

Geopolitical change always requires countries to engage in strategic recalibration. In the Indo-Pacific, projection of power, deterring or coercing adversaries, conducting trade and maintaining communications, largely take place over large expanses of water. This overtly maritime strategic region defines defence policies, diplomacy, and war planning of both local Powers and those that are more remote, like the US, who claim vital interests to be present in the region. With the possible exceptions of war on the Korean peninsula and confrontations

<sup>203</sup> PLA(N) nuclear-powered ballistic missile submarines (SSBNs) will not be operational until the JL-2 missile enters service. See James R. Clapper, Director of National Intelligence, *Worldwide Threat Assessment of the US Intelligence Community*, presented to the Senate Armed Services Committee, 26 February 2015, p. 7.

<sup>204</sup> India has built two Arikant-class SSBNs. The first is undergoing sea trials, while the second was launched in 2014 and is likely to be commissioned in 2015.

<sup>205</sup> The platform numbers for China in Table Six include both the Chinese Coast Guard and China's Maritime Safety Administration.

(Sino-Indian or Sino-Russian) that are currently assessed as remote,<sup>206</sup> the large Eurasian land wars that characterised the history of the 20<sup>th</sup> century are not central to the defence planning of most of the countries in this region.<sup>207</sup> In the Indo-Pacific, seapower and maintaining access to the oceans will increasingly define the strategic outlook of individual countries. China’s “string of pearls” policy that involves the establishment of bases throughout the Indo-Pacific and, likewise, India’s slow but steady expansion of contacts beyond the subcontinent are signs of the policy changes underway. It is also very much evident in new approaches to force planning including the strategic rebalance announced by Washington in early-2012 and in ongoing work to refine the concept of air-sea battle (officially termed Joint Concept for Access and Maneuver in the Global Commons or JAM-GC). The growth of regional navies—in both numbers of platforms and modernisation—reflects, therefore, both the requirements imposed by geography and the new resources governments can draw upon. For Powers, with force structures that predate the current era, existing military technologies and war-fighting doctrines are now being adapted to take account of the new strategic pre-eminence of the maritime environment. Such re-thinking and institutional change will occur at different speeds among countries, creating a lag that is already contributing to regional tensions.

Those tensions are contributing to increased defence expenditure and a growth in navies throughout Asia. Defence spending in the Indo-Pacific region, which surpassed that of Europe for the first time in 2012, will continue to increase in the coming decades. Asian governments will use increased revenues from expanding economies to acquire more advanced capabilities, including modern submarines, cruise missiles, surface-to-air capabilities, short- to medium-range ballistic missiles, air-to-air missiles, air-to-air refuelling, ISR (both aerial and underwater), digital data-links, airborne early warning and control platforms, and electronic warfare systems. Many of these capabilities obviously contribute to greater maritime domain awareness and will continue to facilitate inter-state cooperation. Throughout Asia, however, governments are also responding to China’s rise by “revamping their own force-modernisation priorities, alliances and overall strategic choices.”<sup>208</sup> This expansion and/or modernisation of regional navies is taking place against a backdrop of strategic uncertainty, including challenges to maritime boundaries and sovereignty assertion in EEZs—concerns that are underscored by Beijing’s own increasingly assertive policy declarations and behaviour.

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<sup>206</sup> Some commentators argue that it is the current relative quiescence of China’s land boundaries—“an exceptional achievement, by historical standards”—that has allowed Beijing to become more assertive at sea. See Colin Dueck, “Geography and World Politics”, *Claremont Review of Books* (online), 12 June 2013 [accessed on 4 July 2013 at [www.claremont.org/article/geography-and-world-politics/](http://www.claremont.org/article/geography-and-world-politics/)].

<sup>207</sup> Geography would likely play a role in such conflicts. A conventional conflict might be contained to the Korean peninsula. The Himalayan-Karakorum mountain chain that forms the border between India and China naturally inhibits large-scale mobile warfare. The Sino-Indian War (1962) revealed the difficulty of conducting military operations at such altitudes. See Kamphausen, “Asia as a Warfighting Environment”, in Mahnken and Bluemthal (eds.), *Strategy in Asia; The Past, Present and Future of Regional Security*, pp. 12–14.

<sup>208</sup> Michael Raska, “Submarine Modernisation in East Asia: Competitive Strategies”, *RUSI Newsbrief*, September 2014, p. 25.

## 4.2 US Decline and Sino-US Competition<sup>209</sup>

Since the defeat of Japan in 1945, the US has been the region's hegemonic actor, able to project overwhelming power to deter aggression and reassure allies. American power—military and economic—has upheld the regional status quo. In recent years, however, the ability to sustain that role has been called into question both by Washington's domestic difficulties (indebtedness and political polarization) and by the simultaneous rise of China. "What should be evident," one Australian academic has written, "is that the United States is moving away from its traditional role of global security provider to that of security enhancer."<sup>210</sup> This is interpreted to mean a more cautious US policy toward international and regional security, working with partners (both traditional and otherwise) and allies to develop defence capabilities in order to advance common security objectives. While Washington has declared a continued willingness to maintain the post-1945 order, its increased reliance on regional allies and partners is unsettling to many governments. For some regional governments, it calls into question the reliability of Washington's extended deterrent and, implicitly, it enhances China's strategic profile that China.

Policy-makers in Washington have acknowledged that the re-emergence of China as a Great Power is the most significant long-term strategic challenge that the US faces both in Asia and globally.<sup>211</sup> The roots of Sino-US competition lie in what appears to be a fundamental incompatibility of many of the two countries' strategic interests.<sup>212</sup> From Washington's perspective, Beijing is attempting to advance an agenda that threatens the regional status quo that Washington has long upheld. "The underlying geo-strategic objective for the United States in Asia and the Pacific," a report prepared by a US think-tank observed, "has been to maintain a balance of power that prevents the rise of any hegemonic state from within the region that would threaten US interests by seeking to obstruct American access or dominate the maritime domain."<sup>213</sup> China, on the other hand, has been described as "an increasingly assertive, distinctly non-status-quo power, attempting to rearrange the regional geopolitical order in its favour."<sup>214</sup> The constraint imposed by its geography—a land Power with very long borders—has declined as continental threats have lessened and maritime interests have grown.<sup>215</sup> This was most recently underscored by Beijing's most recent defence policy statement, entitled *China's Military Strategy*

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<sup>209</sup> This section draws upon the author's earlier publication, *Determinants of US Strategic Policy in the Asia-Pacific*, DRDC-RDDC-2015-L034 (January 2015).

<sup>210</sup> Alan Dupont, *Full spectrum defence: Rethinking the fundamentals of Australian defence strategy* (Lowry Institute: Sydney, March 2015), p. 8.

<sup>211</sup> The US and China look at the latter's rise rather differently. Washington regards the rise of China as the most significant geopolitical challenge it now faces. However, Beijing makes reference to "reclaiming" its status as a major power through a policy of national rejuvenation. While many Western Powers might interpret that as nationalist rhetoric, China's outlook is far from ahistorical when one considers that it was only after 1800 that Europe could be considered more industrialised. Before that time, China had accounted for a greater share of world manufacturing output than Europe. See Paul Kennedy, *The Rise and Fall of the Great Powers* (Unwin-Hyman: London, 1988), p. 149.

<sup>212</sup> Guy Roberts, "Acknowledge and Commit, Disagree and Continue: US China Policy for the 21<sup>st</sup> Century", *Security Challenges*, Vol. 10, No. 1, 2014, pp. 88–89.

<sup>213</sup> Berteau and Green, *U.S. Force Posture Strategy in the Asia Pacific Region*, p. 13.

<sup>214</sup> Chris Rahman, "The Inescapable Ocean: On Understanding Australia's Strategic Geography" in Jones (ed.), *A Maritime School of Strategic Thought for Australia*, p. 70.

<sup>215</sup> This argument is made in Michael A. Glosny and Phillip C. Saunders, "Correspondence: Debating China's Naval Nationalism", *International Security*, Vol. 35, No. 2, Fall 2010, p. 168.

(May 2015). That document stated that “the traditional mentality that land outweighs the sea must be abandoned” and that “great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests.”<sup>216</sup> Beijing believes that, as a Great Power with one-fifth of the global population and the oldest continuous civilization, it is entitled to amend the international order so that it better reflects Chinese national interests.

China’s maritime strategy identifies two areas that are of primary interest: the ‘first island chain’ and the ‘second island chain’. The first demarcates an area of China’s vital national interests, and where the People’s Liberation Army (Navy) or PLA(N) believes it can assert sea control. The first island chain begins south of Japan, runs through the Ryukyu Islands, Taiwan, the Philippines, to Malaysia (Borneo) and Indonesia. The line includes the Yellow Sea facing Japan and Korea, the East China Sea including Taiwan, and the South China Sea. The second island chain encloses an area where the exercise of sea denial is the aim. It runs from Japan, through the Bonin Islands, the Mariana Islands, Guam, Palau and the Caroline Islands, to Indonesia. The area inside covers most of the western Pacific Ocean. Together, the two “chains” encompass a maritime area out to approximately 3,300 kms and, most significantly, includes most major East Asian SLOCs (see Figure 10).

China’s attempts to alter maritime boundaries, and its unilateral interpretation of international law regarding its EEZs in the South and East China Seas (thereby restricting navigation for military vessels), are consistent with its maritime strategy. Along with the US relations with Taiwan, that are a continuing source of major Sino-US tensions, these issues hold a very real potential for unexpected clashes at sea and rapid escalation of tensions beyond the region itself.<sup>217</sup> Despite public US opposition, Beijing has not altered its positions on these issues. A report released in 2014 by the US Department of Defense on the Chinese armed forces observed that “there have been no signs that China’s military disposition opposite Taiwan has changed significantly. The PLA has continued to develop and deploy military capabilities to coerce Taiwan or to attempt an invasion.”<sup>218</sup> In the case of maritime boundaries and its EEZ, China has become more assertive as the frequency of confrontations with regional governments attest. In addition to its ongoing dispute over the ownership of the Senkaku/Diaoyu islands, in December 2013 China extended its air-defence identification zone in the South China Sea to overlap with that of Japan, further fuelling regional tensions.<sup>219</sup> More recently, in January 2015, the Philippines and the US issued a

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<sup>216</sup> China, Information Office of the State Council, *China’s Military Strategy* (Beijing, May 2015).

<sup>217</sup> The 2001 interception and emergency landing of a US Navy EP-3 surveillance aircraft 75 miles off the coast of China led to a major crisis in Washington’s relations with Beijing. More recently, the harassment of the USS *Impeccable*, an ocean surveillance vessel, by Chinese vessels led to the dispatch of a US Navy destroyer. (See Ann Scott Tyson, “Navy Sends Destroyer to Protect Surveillance Ship in South China Sea”, *The Washington Post*, 13 March 2009.)

<sup>218</sup> United States, Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments involving the People’s Republic of China 2014* (Washington, D.C., April 2014), p. 53. The most recent and Third Taiwan Strait Crisis (July 1995 and April 1996) was triggered by a threat from China to use force should Taiwan declare independence following its presidential election. Beijing’s attempt to intimidate Taiwan failed when the US deployed the largest concentration of naval power in Asia since the Vietnam War, including two carrier strike groups. The crisis helps explain the build-up of the People’s Liberation Army – Navy (PLA(N)). See Robert S. Ross, “The 1995-1996 Taiwan Strait Confrontation: Coercion, Credibility, and Use of Force”, *International Security*, Vol. 25, No. 2, Fall 2000, pp. 87–123.

<sup>219</sup> Ian E. Rinehart and Bart Elias, *China’s Air Defense Identification Zone (ADIZ)*, (Congressional Research Service: Washington, D.C., 30 January 2015), pp. 24–25.

joint statement regarding Beijing's policy of "island building" to extend maritime boundaries in the South China Sea.<sup>220</sup> Manila followed this up with the submission of a claim under UNCLOS to the Permanent Court of Arbitration at the Hague, a case that the court began reviewing in summer 2015.<sup>221</sup> China's refusal to acknowledge the legitimacy of the Court in areas of maritime boundary disputes undermines a peaceful means of conflict resolution.



**Figure 10: The First and Second Island Chains.**

Source: Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2010* (Washington, D.C., 2009), p. 23.

Some analysts believe that, while it angers regional Powers, Beijing "appears to limit actions to stay below the threshold that might produce a strong counter-China coalition, including the United States."<sup>222</sup> The fear in Washington is that China, increasingly confident in the rightness of its own policies, might feel less constrained if it believes it can sustain a confrontation with the US.<sup>223</sup> At present, however, the strategic competition seems limited to carefully calibrated probing

<sup>220</sup> Ridzwan Rahmat and James Hardy, "US, Philippines call on China to halt island building", *Jane's Defence Weekly*, 28 January 2015, p. 6.

<sup>221</sup> Toby Sterling, "Court begins hearing Philippines, China dispute over South China Sea", BBC News, 8 July 2015.

<sup>222</sup> See, for example, Christopher Yung and Patrick McNulty, *China's Tailored Coercion and Its Rivals' Actions and Responses: What the numbers tell us* (Center for New American Security: Washington, D.C., January 2015), p. 15.

<sup>223</sup> Thomas Mahnken, *Asia in the Balance – Transforming US Military Strategy in Asia* (American Enterprise Institute: Washington, D.C., June 2012), p. 9.

while the Chinese leadership remains focused on maintaining domestic political stability—no mean task in such a large and populous country.<sup>224</sup> It may be, as some have argued, that Beijing believes by “balancing economic and military development, [it] may rise to great power status sustainably and with minimal foreign opposition.”<sup>225</sup> Likewise, most US policymakers (and most likely those in China) understand that stability in Asia is a function of the Washington-Beijing relationship. This includes confronting the threat of instability on the Korean peninsula where China is acknowledged as the most effective interlocutor with Pyongyang.

There are, nevertheless, areas where significant bilateral tensions are proving intractable, with potentially dangerous consequences for strategic stability. There are serious disagreements over human rights issues and each other’s economic policies. Beijing categorically opposes Washington’s leadership role in Asia, especially its relationship with Taiwan. US efforts to reassure US allies through improved defence contacts and arms sales (particularly to Taiwan) are viewed as threatening and frequently inflame Sino-US relations.<sup>226</sup> Moreover, China’s drive to alter the regional status quo means that it has less of an interest in transparency and confidence-building. Initiatives to create stronger military-to-military ties have, therefore, borne little fruit and Washington is often uncertain how to interpret Chinese behaviour.

Military modernisation and expansion, and the strategic options that they are creating for Beijing, are the most tangible characteristics of the challenge China represents for Washington. Chinese policies are intended to increase the cost to Washington of maintaining its leadership in Asia. As a US strategist has written, “China has been working systematically to undermine the American approach to assurance, deterrence, and warfighting.”<sup>227</sup> The growth of China’s defence expenditure that has enjoyed annual double-digit increases during the past 25 years—in 2014 alone it grew by 12.2 percent—has led to a vast increase in its military capabilities, in particular those of its navy (see Table 5).<sup>228</sup> The speed with which the PLA(N) has developed a wide array of modern platforms and capabilities, some rivalling those of the United States Navy (USN), as well as infrastructure, have taken planners in Washington by surprise.<sup>229</sup> The acquisition within the Chinese arsenal of increasingly sophisticated anti-access capabilities is especially worrying (see Table 6). Elaborating on this, a former US Secretary of Defense stated in May 2010 that a combination of lethal missiles and submarines “could end the operational sanctuary our Navy has enjoyed in the Western Pacific for the better part of six decades.”<sup>230</sup> Raising the costs of US power projection into Asian waters beyond what Washington views as tolerable, is at root the aim of China’s current maritime strategy. Ideally from China’s perspective, it would overturn the

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<sup>224</sup> Clapper, Director of National Intelligence, *Worldwide Threat Assessment of the US Intelligence Community*, p. 19.

<sup>225</sup> Andrew S. Erikson and Lyle J. Goldstein, “Studying History to Guide China’s Rise as a Maritime Great Power”, *Harvard Asia Quarterly* Vol. 12, Nos. 3-4, Winter 2010, p. 38.

<sup>226</sup> See Adam P. Liff and G. John Ikenberry, “Racing toward Tragedy? China’s Rise, Military Competition in the Asia-Pacific, and the Security Dilemma”, *International Security* Vol. 39, No. 2, Fall 2014, pp. 52–91.

<sup>227</sup> Thomas G. Mahnken, *Asia in the Balance: Transforming US Military Strategy in Asia*, (American Enterprise Institute: Washington, D.C., June 2012), p. 9 and United States, Department of Defense, *Quadrennial Defense Review 2014* (Washington, D.C., March 2014), p. 6.

<sup>228</sup> Liff and Ikenberry, “Racing Toward Tragedy?”, p. 66.

<sup>229</sup> John Pomfret, “Defense Secretary Gates: U.S. Underestimated Parts of China’s Military Buildup”, *The Washington Post*, 9 January 2011.

<sup>230</sup> Michael Richardson, “Naval powers in Asia: Rise of Chinese navy changes the balance”, *The Straits Times*, 10 May 2010.

order upheld by the US since 1945 possibly without a Great Power war. But, even if war should occur, the costs to US capabilities would be such that China would nonetheless prevail.

**Table 5: Defence Expenditure by US and China (in US\$ billions).**

	China (official)	China (SIPRI estimate)	China (% GDP)	US (SIPRI estimate)	US (%GDP)
2010	<b>84.26</b>	<b>136.5</b>	<b>2.3</b>	<b>720.4</b>	<b>4.9</b>
2011	<b>94.89</b>	<b>146.2</b>	<b>2.0</b>	<b>711.4</b>	<b>4.7</b>
2012	<b>105.79</b>	<b>157.6</b>	<b>1.9</b>	<b>688.8</b>	<b>4.2</b>
2013	<b>117.10</b>	<b>166.1</b>	<b>1.8</b>	<b>682.5</b>	<b>4.2</b>

Source: Anthony H. Cordesman, *Chinese Strategy and Military Power in 2014* (Center for Strategic and International Studies: Washington, D.C., November 2014), p. 91.

**Table 6: USN and the PLA(N) Compared (2014).**

	USN		PLA(N)
	Total	Pacific	
Navy	<b>265,000</b>	<b>n.a.</b>	<b>255,000</b>
Marines	<b>173,000</b>	<b>n.a.</b>	<b>10,000</b>
Submarines (SSBNs)	<b>14</b>	<b>8</b>	<b>5</b>
Submarines (SSNs)	<b>55</b>	<b>31</b>	<b>5</b>
Submarines (SSGNs)	<b>4</b>	<b>2</b>	
Submarines (SSKs)			<b>53</b>
Aircraft Carriers	<b>10</b>	<b>6</b>	<b>1</b>
Cruisers	<b>22</b>	<b>9</b>	
Destroyers	<b>62</b>	<b>34</b>	<b>25</b>
Frigates	<b>10</b>		<b>49</b>
Corvettes			<b>8</b>
Fast Attack - Missile			<b>86</b>
Littoral Combat Ships <sup>231</sup>	<b>4</b>	<b>4</b>	
Coastal Patrol	<b>13</b>		<b>119</b>
Amphibious			
LHAs	<b>10</b>	<b>5</b>	
LPDs	<b>9</b>	<b>5</b>	<b>3</b>
Mine Counter-measures	<b>12</b>	<b>9</b>	<b>40</b>

Source: *Jane's Fighting Ships, 2014–2015*.

#### 4.2.1 Japan and Taiwan

Within the context of strategic affairs in Asia, the challenge posed by China's rise cannot only be understood in terms of a Sino-US dyad. China's military expansion and its lack of transparency

<sup>231</sup> Shortly after the USN announced its intention to modify the Littoral Combat Ship to improve its combat potential and its survivability, the ships were reclassified as frigates. Grace Jean, "USN classifies modified LCS as frigate", *Jane's Defence Weekly*, 21 January 2015, p. 5.

are deeply troubling to a number of regional governments that fear China's desire to revise the existing maritime order (viz., the South and East China Seas) might broaden and intensify in coming years. Regional governments also view Beijing's procurement of advanced anti-access systems that undermine Washington's ability to project power and its ongoing pursuit of a secure sea-based second strike nuclear force as part of a broader strategic agenda.<sup>232</sup> Reassuring these allies and partners adds to the pressure that US policy in Asia is now experiencing.

Alongside the security threat posed by North Korea, Japan is most deeply concerned by current Chinese policy.<sup>233</sup> The creation of Japan's first National Security Council in 2014, the approval that same year of its first national security strategy, and the increase in defence expenditure, testify to a growing unease in Tokyo. This unease is informed by a fear of Chinese ambitions and a gnawing doubt about the US extended deterrent under which Japan has long sheltered. In late-January 2014, Prime Minister Shinzo Abe called for a curbing of regional defence spending, and warned that the growth of Chinese military capabilities could lead to the outbreak of an "inadvertent conflict".<sup>234</sup> In late-2014, Tokyo's anxieties were publicly voiced during ongoing negotiations to update the US-Japan defence cooperation accord because early press statements said nothing about the US commitment to defend Japanese territories that China has claimed.<sup>235</sup> Shortly after, Japanese legislators also expressed concerns when the US indicated that it would temporarily reduce its naval posture (i.e., by one aircraft carrier) in East Asia for part of 2015.<sup>236</sup>

Japan has sought to reduce its strategic vulnerability vis-à-vis China by augmenting its own national defence capabilities, by altering its traditional post-1945 policy of self-restraint in order to be a more effective US partner, and by reaching out to other regional countries.<sup>237</sup> Tokyo has indicated that this approach will continue. In January 2015, the Diet adopted the largest defence budget (US\$42 billion) in Japan's history. While the most recent budget increased spending by only 1.97 percent, it is nonetheless significant that all of the major programmes, including those of the navy, were approved. Many of the new platforms and defence systems identified in the budget are clearly intended to counter Chinese capabilities.<sup>238</sup> For example, Japan's Maritime Self-Defence Force recently took delivery of a helicopter carrier, its biggest warship since 1945, designed to deal with the PLA(N)'s submarine threat.<sup>239</sup> Tokyo's more assertive strategic profile nonetheless leaves some regional governments (notably China) and much of the Japanese

<sup>232</sup> Dan Blumenthal, "US Responses to China's Military Modernization" Ashley J. Tellis and Travis Tanner (eds.), *Strategic Asia 2012-2013: China's Military Challenge* (National Bureau of Asian Research: Washington, D.C., 2012), pp. 311–312. On China's sea-based deterrent, see Benjamin Schreer, "China's Development of a More Secure Nuclear Second-Strike Capability: Implications for Chinese Behavior and U.S. Extended Deterrence", *Asia Policy*, No. 19, January 2015, pp. 14–20.

<sup>233</sup> Xenia Dormany, *Prepared for Future Threats? US Defence Partnerships in the Asia-Pacific Region* (Chatham House: London, June 2012), pp. 6–7.

<sup>234</sup> Ankit Panda, "Shinzo Abe at World Economic Forum: 'Restrain Military Expansion in Asia'", *The Diplomat*, 23 January 2014.

<sup>235</sup> Paul Kallender-Umezu, "Japan-US Defense Accord 'Asks a Lot, But Gives a Little,' Analysts Claim", *Defense News*, 13 October 2014.

<sup>236</sup> Tetsuo Kosaka, "Japan frets over coming absence of US aircraft carriers", *Asian Review*, 30 October 2014.

<sup>237</sup> Ian Buruma, "Can He Take Back Japan?", *The New York Review of Books*, 6 November 2014.

<sup>238</sup> Justin McCurry, "Japan reveals record defence budget as tensions with China grow", *The Guardian*, 14 January 2015. See also Craig Caffrey and James Hardy, "Japan raises defence spending by 1.97% in FY 2015 budget proposal", *Jane's Defence Weekly*, 21 January 2015, p. 14.

<sup>239</sup> Akhilesh Pillalamarri, "Japan's Navy Unveils 'Aircraft Carrier in Disguise'", *The National Interest* (online), 25 March 2015.

population uncomfortable with a revival of Japanese military power. Given that constraint, a key element in Japanese policy toward China is to find ways to assist Washington in maintaining a credible commitment to its defence.

Taiwan's security situation is unique. China does not acknowledge its independence and, in its latest defence statement, declares reunification to be "a historical inevitability for the great rejuvenation of the Chinese nation."<sup>240</sup> In recent years, cross-strait tensions have reduced considerably, as a result of growing economic ties and social contacts between Taipei and Beijing, and China is now Taiwan's largest trading partner and leading foreign investor. A conflict between the two countries would, therefore, impose a heavy burden on China. However, the situation is inherently unstable. Beijing has made clear that it regards a Taiwanese declaration of independence as a direct threat.<sup>241</sup> To thwart that and to ensure eventual reunification while reducing the likelihood of US intervention is a principal objective of China's maritime strategy.

Although Washington has no position on Taipei's sovereignty and adheres to a one-China policy, the island's security has always relied on the US extended deterrent. Nevertheless, it is not clear what Washington's precise obligations would be in the face of Chinese aggression. That ambiguity has been purposeful, for it has left the traditionally cautious Chinese political leadership uncertain as to what the US would do in the event of cross-strait conflict.<sup>242</sup> Given the increase in the scale and sophistication of Beijing's anti-access capabilities, however, that approach might no longer be sustainable.<sup>243</sup> The demand for clarity, that will increasingly become a key component of the Sino-US competition, will present Washington with a major strategic dilemma. US policy-makers will need to reassess what level of burden their country is willing to bear to stop a successful Chinese invasion of Taiwan, and the cost to US naval assets could be very steep. Walking away from a long-standing defence commitment to Taiwan would, however, seriously damage the credibility of the US extended deterrent in Asia with serious consequences for relations with other regional allies, and would likely undermine confidence in security assurances that Washington has given allies and partners elsewhere. Whatever the US does elsewhere in Asia, it must bear in mind how any decision might affect Beijing's calculus of the chances of achieving its objective of resolving the cross-strait issue.

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<sup>240</sup> China, Information Office of the State Council, *China's Military Strategy* (Beijing, May 2015).

<sup>241</sup> United States, Office of the Secretary of Defense. *Annual Report to Congress: Military and Security Developments involving the People's Republic of China 2014* (Washington, D.C., 2014), p. 6.

<sup>242</sup> In 2001, George W. Bush stated that the US was obliged to defend Taiwan in the face of Chinese aggression. It was a far stronger position than his predecessors had asserted. (See David E. Sanger, "U.S. Would Defend Taiwan, Bush Says", *The New York Times*, 25 April 2001.) At that time, Senator John Kerry disagreed that such an obligation existed. See "Kerry Said U.S. Not Obligated to Defend Taiwan from Attacks (Sen. Kerry's April 25 Speech on President Bush's Remarks)", *American Institute in Taiwan Policy and Documents*, 26 April 2001 [accessed on 15 January 2015 at [www.ait.org.tw/en/20010425-kerry-says-us-not-obligated-to-defend-taiwan-from-attacks.html](http://www.ait.org.tw/en/20010425-kerry-says-us-not-obligated-to-defend-taiwan-from-attacks.html)]. The Obama Administration has adopted the more traditionally ambiguous position. See Peter Chow, *The US Strategic Pivot to Asia and Cross-Strait Relations: Economic and Security Dynamics* (Palgrave MacMillan: London, 2014), p. 172.

<sup>243</sup> One analyst has called the Chinese submarine threat to Taiwan as "among the most serious, if not the most serious, military concern that U.S. planners must face when evaluating conflicts between the People's Republic of China and Taiwan, as well as any U.S. role in them." See Michael O'Hanlon, "Correspondence: 'Damn the Torpedoes: Debating Possible U.S. Navy Losses in a Taiwan Scenario'", *International Security*, Vol. 29, No. 2, Fall 2004, p. 202.

#### 4.2.2 The US Strategic Rebalance

In November 2011, Secretary of State Hillary Clinton published an article in *Foreign Affairs* entitled “America’s Pacific Century.” It declared that the US stood at a “pivot point” following the wars in Afghanistan and Iraq and that US policy needed to be recalibrated. “One of the most important tasks of American statecraft over the next decade,” Clinton wrote, “will therefore be to lock in a substantially increased investment—diplomatic, economic, strategic and otherwise—in the Asia-Pacific region.”<sup>244</sup> The policy announcement took aim at the perception that the US was unable to withstand the challenge posed by China. The strategic guidance for US defence policy issued two months later emphasised the need to reassert Washington’s global leadership. In its most trenchant passage, it stated that “while the U.S. military will continue to contribute to security globally, *we will of necessity rebalance toward the Asia-Pacific region* (italics in the original).”<sup>245</sup> “The rebalance to Asia,” one author has written, “is intended to bring commitments of U.S. global diplomatic, economic and military resources into balance with expanding U.S. political, economic and security interests in Asia.”<sup>246</sup>

The most visible element of the rebalance or pivot is a correspondingly larger US military presence. Many of the decisions associated with the “strategic rebalance” were nevertheless preceded by a reconsideration of force posture a decade earlier that had been intended to reassure key partners and included a decision to deploy 60 percent of the USN’s submarine fleet in the Pacific.<sup>247</sup> Even before Clinton’s announcement of the strategic pivot, therefore, the US had a sizable military footprint in Asia, including 330,000 military and civilian personnel, five aircraft carrier strike groups (with 180 ships and 1,500 aircraft), and two-thirds of the Marine Corps’ combat strength. In addition, the US Coast Guard had 27,000 personnel deployed in the region.<sup>248</sup>

Despite the earlier concentration of forces, from Washington’s perspective additional force posture changes are again necessary. The forces already committed to support US policy in Asia are, Washington believes, either not properly positioned to address the full-range of current and/or emerging threats or remain vulnerable to the growth in anti-access capabilities, particularly ballistic missile arsenals being acquired by North Korea and China. And, although initial joint USN/USAF authorization for the development of a doctrine (JAM-GC) preceded the 2012 strategic guidance by three years, work has continued in an effort to ensure that US forces are a more effective deterrent and operationally capable.<sup>249</sup>

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<sup>244</sup> Hillary Clinton, “America’s Pacific Century”, *Foreign Policy*, November 2011, p. 57.

<sup>245</sup> United States, Secretary of Defence, *Sustaining US Global Leadership: Priorities for 21<sup>st</sup> Century Defense*, (Washington, D.C., January 2012), p. 2.

<sup>246</sup> Phillip C. Saunders, “The Rebalance to Asia: U.S.-China Relations and Regional Security”, *Strategic Forum* (National Defense University: Washington, D.C., August 2013), No. 281, p. 2.

<sup>247</sup> Secretary of Defense, *Sustaining US Global Leadership: Priorities for 21<sup>st</sup> Century Defense*, p. 2 and Thomas Fargo, “The Military Side of Strategic Rebalancing”, *Asia Policy*, Number 14, July 2012, p. 27.

<sup>248</sup> These figures are taken from Andrew S. Erikson and Justin Mikolay, “Guam and American Security in the Pacific”, in Carnes Lord and Andrew S. Erikson (eds.), *Rebalancing U.S. Forces: Basing and Forward Presence in the Asia-Pacific* (Naval Institute Press: Annapolis, Maryland, 2014), p. 16.

<sup>249</sup> For the development of Air-Sea Battle, see Sam J. Tangredi, *Anti-Access Warfare; Countering A2/AD Strategies* (Naval Institute Press: Annapolis, Maryland, 2013), pp. 32–74.

An important element of the 2012 strategic guidance is a renewed commitment to forward positioning of US naval and air assets (see Figure 11). This is reiterated in the latest USN maritime strategy, *A Cooperative Strategy for 21<sup>st</sup> Century Seapower* (2015).<sup>250</sup> Given the enormous distances involved in projecting power in Asia, forward positioning (i.e., forward basing) is necessary if the US wants to maintain an ability to respond in a timely and effective manner. As a result, current planning calls for some of the most modern naval and air capabilities in the US armed forces to be relocated to Guam or Hawaii, or to bases overseas in the region. Guam, positioned between northeast and southeast Asia, is being transformed into a forward logistics hub. It will “support a complex constellation of both allied cooperation and access rights, on one hand, and American sea-basing and crew rotation, on the other.”<sup>251</sup> While maintaining deployed forces in Japan and Korea, two US naval vessels will also be based in Singapore and 2,500 marines in Australia. When the redeployment is completed, 60 percent of the US fleet and naval air, 60 percent of the US Air Force’s overseas forces, 70,000 combat troops and 2,500 Marines will have been moved into Asia. These forces will include the USN’s “most advanced warfighting platforms (...), including multi-mission ballistic missile defense-capable ships; submarines; and intelligence, surveillance, and reconnaissance (ISR) aircraft”, as well as all three Zumwalt-class destroyers.<sup>252</sup> These forces are intended “to enhance U.S. ability not only to respond to regional events but also to shape them before they occur.”<sup>253</sup>

The big question surrounding all strategic planning is finances. At present, it is impossible to forecast what the medium- to long-term consequences for the US armed forces, and the USN in particular, will be of Washington’s current fiscal retrenchment policy. Even with sequestration and other budget cuts, the US has the most advanced and most capable armed forces in the world today and the USN remains the most formidable navy. It is nonetheless reasonable to assume that readiness and procurement will suffer as the availability of funds decreases and the high cost of needed naval force modernisation takes hold. “The shipbuilding plan, at least for 2015 through 2019,” a report by the Congressional Budget Office observes, “is based on an assumption of funding at the President’s requested level—a level that exceeds the amounts scheduled under current law, which caps discretionary funding through 2021.”<sup>254</sup> This assessment supports conclusions reached by the Department of Defense that, absent an increase in funding that has so far not yet happened, the USN would need to cut a number of new ship acquisitions (including destroyers and submarines), one aircraft carrier, and place six destroyers on reduced status.<sup>255</sup> Additional pressure will inevitably flow from the Ohio-class ballistic missile submarine replacement programme that is slated for the 2030s in order to maintain the sea-based leg of the strategic triad. In other words, an enhanced US presence in the Asia-Pacific relies upon a navy that, should current spending schedules persist, will not be able to avoid further downsizing.

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<sup>250</sup> Department of the Navy and the United States Coast Guard. *A Cooperative Strategy for 21<sup>st</sup> Century Seapower* (Washington, D.C., March 2015).

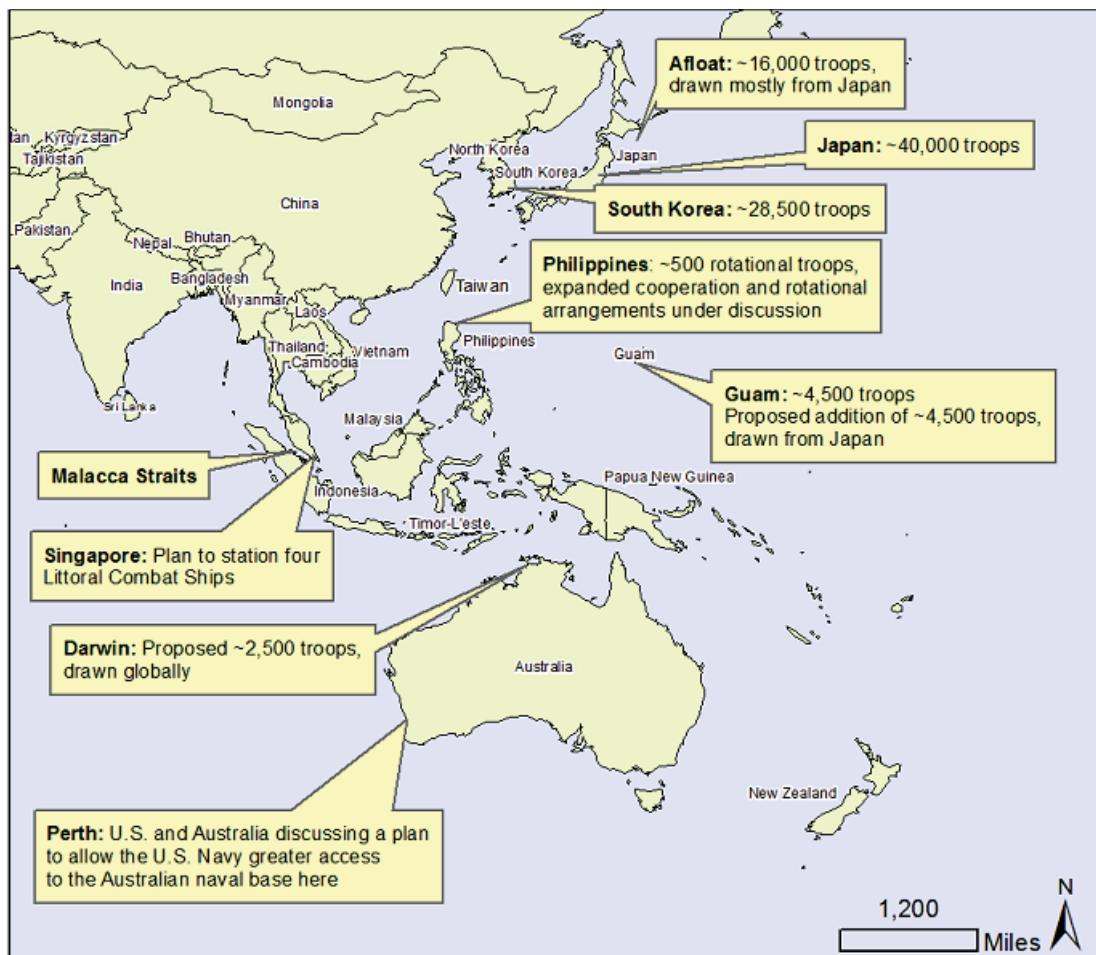
<sup>251</sup> Erikson and Mikolay, “Guam and American Security in the Pacific”, p. 17.

<sup>252</sup> *A Cooperative Strategy for 21<sup>st</sup> Century Seapower*, p. 11.

<sup>253</sup> Erikson and Mikolay, “Guam and American Security in the Pacific”, p. 24.

<sup>254</sup> Congressional Budget Office, *An Analysis of the Navy’s Fiscal Year 2015 Shipbuilding Plan* (Washington, D.C., December 2014), p. 3.

<sup>255</sup> Department of Defense, *Estimated Impacts of sequestration-Level Funding: United States Department of Defense Fiscal Year 2015 Budget Request* (Washington, D.C., April 2014), pp. 3-3, 4-7 to 4-9.



**Figure 11:** Plan for “Forward Positioning” following 2012 Strategic Guidance.

Source: Mark Manyin, Stephen Daggett, Ben Dolven, Susan V. Lawrence, Michael Martin, Ronald O’Rourke, and Bruce Vaughn, *Pivot to the Pacific? The Obama Administration’s “Rebalancing” Toward Asia* (Congressional Research Service: Washington, D.C., 28 March 2012), p. 3.

Given the drawdown in the size of the USN<sup>256</sup> and the current array of its global security challenges, it is an open question if Washington will be able to project adequate naval and air power to maintain a credible extended deterrent as well as its traditional regional leadership function. For Washington, that includes reassuring allies that perceive a threat arising from China’s assertiveness and apparent ambitions while upholding a rules-based international order,

<sup>256</sup> Some US officials regard the current plan to maintain a fleet of 300 ships for the coming decades as inadequate. In March 2014, the Chief of Naval Operations warned a Congressional committee that the USN is too small and that “for us to meet what the combatant commanders’ request, we’d need a Navy of 450 ships.” See the statement by Admiral Jonathon Greenert in US Congress, House Armed Services Committee, *Hearing on the Proposed Fiscal 2015 Defense Authorization for the Navy Department*, Washington, D.C., 12 March 2014, p. 15.<sup>256</sup> In responding to Adm. Greenert’s comment, Senator James Inhofe asked, “[h]ow can our allies and our adversaries take the pivot into Asia seriously when we aren’t even adequately resourcing the requirements of our combatant commanders?” (p. 3).

including the freedom of the seas.<sup>257</sup> Those goals could be achieved by constructing a sustainable and peaceful relationship with China. This is, of course, the underlying purpose of the US strategic rebalance. As naval theorist Geoffrey Till has pointed out, “there is a need for a clear-sighted and pragmatic policy of retaining China as a major stakeholder in a more multipolar world system and a prospective security and economic partner of the US.”<sup>258</sup> The difficulty is determining how, and even if it is possible, to integrate a key challenger, like Beijing, into this order. China, with its economic and military power (including an increasingly modern nuclear weapons capability), is a Great Power in its own right with a deeply-held national perspective of the country’s place in history. Is it possible to appease China without undermining the core interests of Washington and its regional allies and partners? To date, the answers to that question remain unclear as Beijing persists in its probing of the US-backed order. And, as Henry Kissinger pointed out five years ago, neither Power has “much practice in cooperative relations with equals.”<sup>259</sup> However important that task might appear, the uncertainty that surrounds it is roiling the entire Indo-Pacific region and will likely continue to do so for many years to come.

### 4.3 The Opening of the Arctic

Following the end of the Cold War, members of the Arctic Council (i.e., Canada, Denmark, Norway, Sweden, Finland, Iceland, Russia and the US) pledged to resolve boundary disputes peacefully and to cooperate in specific maritime-related areas, such as search and rescue. In the two decades since, there have been few serious disputes in the northern polar region. This record owes much to the inaccessibility of the region itself and a climate that is hostile to human habitation. As *Global Marine Trends 2030* aptly noted, “technical, economic and environmental challenges remain formidable.”<sup>260</sup> The ten largest cities above the Arctic Circle have a combined population of less than 900,000 people, and one-third live in Murmansk. There are no contentious territorial claims in the region, save that between Canada and Denmark over Hans Island, and the maritime boundary disputes that persist (including contending Canada-US claims in the Beaufort Sea) have so far been the subject of inter-state management.<sup>261</sup> And, in November 2014, after a decade of negotiations, the International Maritime Organisation approved the *International Code for Ships Operating in Polar Seas*. Known as the Polar Code, it includes mandatory technical specifications and survival equipment requirements for ships operating in the Arctic.<sup>262</sup> At first glance, it would seem that the peaceful and cooperative development of this global frontier zone might be possible.

<sup>257</sup> See Seth Cropsey, *Mayday: The Decline of American Naval Supremacy* (Overlook Duckworth: New York, 2013). For an analysis of the USN’s force structure, see Congressional Budget Office, *An Analysis of the Navy’s Fiscal Year 2014 Shipbuilding Plan* (Washington, D.C., October 2013).

<sup>258</sup> Geoffrey Till, “Reactions to the Re-Balance: Asia in General and Southeast Asia in Particular” in Greg Kennedy and Harsh V. Pant (eds.), *Assessing Maritime Power in the Asia-Pacific: The Impact of American Strategic Re-Balance* (Ashgate: London, 2015), p. 99.

<sup>259</sup> Henry Kissinger, *Global Strategic Review Speech*, IISS, London, 10 September 2010 [accessed on 21 September 2015 at <http://www.henrykissinger.com/speeches/091010.html>].

<sup>260</sup> Lloyd’s Register Group et. al., *Global Marine Trends 2030* p. 47.

<sup>261</sup> David Welch, “The Arctic and Geopolitics”, Kimie Hara and Ken Coates (eds.), *East-Asia Arctic Relations: Boundary, Security and International Politics* (The Centre for International Governance Innovation: Waterloo, Canada, 2014), p. 182.

<sup>262</sup> See Julia Jabour, “Progress towards the mandatory code for polar shipping”, *Australian Journal of Maritime and Ocean Affairs*, Vol. 6, No. 1, 2014, pp. 61–67, Daniel Cressey, “Polar Code protects ships and species in icy waters”, *Nature*, 25 November 2014 and Karl Mathiesen, “Polar code agreed to prevent Arctic environmental disasters”, *The Guardian*, 21 November 2014.

Insulating the Arctic from larger geopolitical developments is, however, proving to be increasingly difficult. Growing frictions with Russia could reduce the scope for international cooperation, and any lucrative large-scale resource development that takes place in the region will increase the stakes for countries in Arctic affairs. A report prepared in mid-2012 by a US-based think-tank expressed the belief that multilateral cooperation in the Arctic could continue, but recognised that “[t]here is scope for strategic miscalculation, a loss of faith in multilateral processes that deliver unwelcome findings, or an environmental disaster triggering a spiral of mistrust.” The Arctic is a “rich case study of current and potential areas of international cooperation and tension”, it noted, that could impact on the energy industry, global trade and the relations among the major Powers.<sup>263</sup> Three years later that assessment appears prescient for development of the Arctic touches upon core interests of many governments (see Figure 12).

The Arctic has emerged as an important strategic issue in the 21<sup>st</sup> Century because of global climate change. Some scientists believe that if trends continue there could be ice-free summers in the Arctic within 25 years, and this offers the prospect of longer navigation seasons (see Figure 13). In 2007, both the Northwest Passage (NWP) and the Northern Sea Route (NSR) were ice free for the first time since records have been kept.<sup>264</sup> Since then, a number of governments have expressed interest in the economic potential of circumpolar shipping. The NSR would, for example, reduce the journey from East Asia to Western Europe from 21,000 kilometres via the Suez Canal to 12,800 kilometres, and cut the travel time by between 10 to 15 days.<sup>265</sup> Nevertheless, the challenge of operating commercially viable shipping routes in the high north is considerable. The NWP, for example, that runs through Canadian waters, is the longest and most dangerous of the trans-polar routes. It might not prove fully navigable in the medium-term as a result of unpredictable ice flows.<sup>266</sup> According to a recent report, “[u]ncharted sea-lanes and limited salvage, repair and emergency response infrastructure pose significant dangers to regular shipping through the Northwest Passage.”<sup>267</sup> Perhaps most tellingly, insurance

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<sup>263</sup> Andrew Hart, Bruce Jones and David Steven, *Chill Out; Why Cooperation is Balancing Conflict Among Major Powers in the New Arctic* (Brookings Institute: Washington, D.C., May 2012), p. 1.

<sup>264</sup> “Sea ice loss opens route around northern ice pack”, *CBC News* (online), 10 September 2008 [accessed on 1 May 2015 at <http://www.cbc.ca/news/technology/sea-ice-loss-opens-route-around-northern-ice-pack-1.697336>].

<sup>265</sup> Rodrigue, *The Geography of Transport Systems* (3<sup>rd</sup> ed), p. 11.

<sup>266</sup> IMO, *International Shipping Facts and Figures*, Section 4.

<sup>267</sup> Whitney Lackenbauer and Adam Lajeunesse, *On Uncertain Ice: The Future of Arctic Shipping and the Northwest Passage* (Canadian Defence and Foreign Affairs Institute: Calgary, Alberta, December 2014), p. 4. Russia’s NSR is already being used by shipping companies. In 2009, nuclear-powered icebreakers escorted the first supertanker through the NSR *en route* to Southeast Asia; and Moscow forecast that up to 64 million tons of cargo could be shipped by 2020. However, without a substantial increase in numbers of ice-strengthened commercial ships and tonnage, Russian expectations will not be met. The NSR is not thoroughly charted and sea ice frequently hampers navigation. According to the agency responsible for managing the NSR, in 2012, of 46 registered transits, 25 involved commercial or research vessels (totalling 1.02 million tons) moving between Asia and European ports (including Murmansk) or vice versa; in 2013; however, that number dipped to 23 vessels (totalling 1.08 million tons) out of 71 registered transits. The data for ships and tonnage includes cargo and excludes ballast. See Northern Sea Route Information Office, *Transit Statistics* [accessed on 12 November 2014 at [www.arctic-lio.com/nsr\\_transits](http://www.arctic-lio.com/nsr_transits)]. Some experts have argued that draft limitations and channel widths will always limit the cargo capacity of ships using the NSR. See Michael D. Bowes, *Impact of Climate Change on Naval Operations in the Arctic* (Center for Naval Analysis: Alexandria, Virginia, April 2009), p. 10.

premiums for the NSR make the voyage nearly as expensive as the traditional route through the Suez Canal.<sup>268</sup>



*Figure 12: The Arctic Region.*

Source: [www.lib.utexas.edu/maps/islands\\_oceans\\_poles/arctic\\_ref802647\\_1999.jpg](http://www.lib.utexas.edu/maps/islands_oceans_poles/arctic_ref802647_1999.jpg) (public domain).

<sup>268</sup> Costas Paris, "Wrong Type of Ice Hampers the Northern Sea Route", *The Wall Street Journal*, 29 April 2014.



**Figure 13: Arctic Shipping Routes.**

Source: Jean-Paul Rodrigue, Ph.D. Professor, Dept. of Global Studies & Geography Hofstra University. Copyrighted. Used with permission.

At present, the Arctic policy of most governments is based largely on projected benefits. The Transpolar Sea Route that crosses the Arctic Ocean between North America and Asia is sometimes mentioned but is entirely hypothetical for it involves ice-free conditions that have not ever been observed. And, given the existing transport infrastructure, the Arctic Bridge, linking Churchill, Manitoba, with either Murmansk or Narvik, would likely only be useful for the grain trade.<sup>269</sup> Should either the NWP or the NSR prove economically viable, control of those sea lanes will confer important political, economic and military leverage on neighbouring states, particularly if large-scale resource development in the Arctic occurs. And there will, of course, be costs. Given the region's inaccessibility, it is conceivable that large-scale human presence and

<sup>269</sup> Rodrigue, *The Geography of Transport Systems* (3<sup>rd</sup> ed), p. 11.

activity in the Arctic could precede adequate government control and regulation. This would create a vacuum of effective authority and lawlessness, generating its own set of problems. Cost-benefit assessments that take into account such possibilities are, therefore, necessarily informing current policy planning for future maritime security needs in the Arctic.

All of the Arctic states continue to advocate peaceful development of the region, but some are also augmenting their military presence in the region. Both Norway and Denmark, while emphasizing resource exploitation and sovereignty assertion, have invested in the procurement of new warships capable of operating in Arctic waters, and the latter has created an Arctic region military command structure.<sup>270</sup> In late-2014, Stockholm asked Nordic Defence Cooperation (NORDEFCO), an organization promoting military cooperation among Sweden, Finland, Norway, Denmark and Iceland, to examine the feasibility of a modular Nordic-Baltic Battle Group “to better protect strategic areas, such as the High North Arctic region and the Baltic Sea area.”<sup>271</sup> More recently, in early-May 2015, Norway announced that it would spend an additional US\$500 million to improve its anti-air and armour capabilities for operations in the country’s northern reaches.<sup>272</sup> Canada likewise wants to ensure that its armed forces have a more regular and sustained presence in the region, and its navy is exercised each summer in Operation Nanook in northern Baffin Bay. *Canada’s Northern Strategy* (2009) ties the reinforcement of the country’s sovereignty in the Arctic to economic and social development, as well as protection of the region’s sensitive ecology.<sup>273</sup> Until recently, however, the US has seemed to be a reluctant participant in modern Arctic.<sup>274</sup> The US Navy’s interim document, *Arctic Roadmap* (2014), stated that the “military threat environment in the Arctic Region has diminished significantly and the risk of armed conflict in the Arctic region is projected to remain low for the foreseeable future.” Any role for the USN in Arctic waters is described as being “in support of Coast Guard search and rescue, disaster relief, law enforcement, and other emergency/civil support operations.”<sup>275</sup> This approach was maintained when, in April 2015, the US assumed the chairmanship of the Arctic Council. However, the deterioration in US relations with Russia offers a possible explanation why QDR 2014 notes that Arctic strategy is still under review.

While it is not the sole cause of the increased military activity in the high north, Russian policy is the main driver of that trend. Russia is the most significant player in Arctic affairs, and its *realpolitik* approach to world affairs (i.e., pursuit of power as a national interest and the use of armed force) could dash any hopes over the next decade at least for the peaceful development of the region. In recent years, the Arctic has become an important component of post-Soviet national identity, and President Vladimir Putin has made frequent visits to the region.<sup>276</sup> Viewing it as a

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<sup>270</sup> Frederic Lasserre, Jérôme Le Roy, Richard Garon, “Is there an arms race in the Arctic?”, *Journal of Military and Strategic Studies*, Vol. 14, Issues 3 & 4, 2012, p. 10.

<sup>271</sup> Gerard O’Dwyer, “Sweden Proposes Aggressive Nordic Defense”, Defense News (online), 10 February 2015 [accessed on 11 February 2015 at [www.defensenews.com/story/defense/policy-budget/warfare/2015/02/10/sweden-nordic-cooperation-russia-nordefco-cooperation-nbg-sreide-battlegroup/22865811](http://www.defensenews.com/story/defense/policy-budget/warfare/2015/02/10/sweden-nordic-cooperation-russia-nordefco-cooperation-nbg-sreide-battlegroup/22865811)].

<sup>272</sup> Gerald O’Dwyer, “Norway adds \$500M to Bolster High North”, *Defense News*, 4 May 2015.

<sup>273</sup> Canada, *Canada’s Northern Strategy; Our North, Our Heritage, Our Future* (Ottawa, 2009), pp. 2–5.

<sup>274</sup> Grace Jean, “US Coast Guard wrangles with ice breaker shortage”, *Jane’s Defence Weekly*, 4 March 2015, p. 10.

<sup>275</sup> United States Navy, Task Force Climate Change, *US Navy Arctic Roadmap 2014-2030* (Washington, D.C., February 2014), p. 13.

<sup>276</sup> Pavel K. Baev, “Russia’s Arctic Policy: Geopolitics, Mercantilism and Identity-Building”, *FIIA Briefing Paper* 73, 17 December 2010, p.6.

hitherto untapped treasure trove, Russian leaders are eager that their country benefit from the enormous resources there, much of which lies within Russian territory, sovereign waters or the EEZ.<sup>277</sup> Western economic sanctions and falling energy prices are undermining Russia's ability to afford its long-term aims. While they could delay Moscow's timetable for the region, they appear to be fortifying Russia's resolve to advance its own Arctic development agenda.

Admittedly, the size of the deployments and the capabilities involved are far below Cold War levels and the emergence of a harder line in Moscow's Arctic policy was already evident before the current tensions. As early as mid-2007, for example, Russia reintroduced long-range air patrols over the Arctic Ocean. In 2008, the commander of the Russian Navy publicly mused about the potential for a "redistribution of power up to armed intervention", and the following year Moscow's declared Arctic policy emphasised securing sovereignty over its strategic resources in the region and ensuring exclusive control over the NSR.<sup>278</sup> Five years later, following the rapid deterioration of Russia's relations with the West, Putin announced a much larger increase in the military presence in the region in order "to have all the levers for the protection of its security and national interests."<sup>279</sup> Since then, the military buildup in the Arctic has continued with the establishment of a new joint forces strategic command that is slated to include two mechanised infantry brigades (by 2016), ten military airfields, and the integration of the Russian Navy's Northern Fleet.<sup>280</sup> And, in early-April 2015, Moscow conducted a large-scale parachute drop near to the North Pole, an action that was likely intended to assert Russian maritime boundary claims.<sup>281</sup> The harder policy line, as well as a presumed incursion of a Russian submarine in Sweden's territorial waters in mid-2014, threats made by Russia's ambassador in Denmark in early-2015 about that country's participation in sea-based ballistic missile defence system, and reporting that Russian officials are taking an increased interest in Norway's coastal waters, are, feeding a growing sense of unease.<sup>282</sup> This will almost certainly continue as the strategic competition associated with a slowly emerging multi-polar system takes shape. As it does, the importance of the Arctic as a strategic region—for power projection and as a bastion for Russia's sea-based deterrent—will steadily grow. As one commentator has written, "most analysts have long concluded that the Arctic's future would be dominated by economic development and international cooperation, [but] thanks to Russia's most recent behaviour in the region, such a conclusion is no longer so certain."<sup>283</sup>

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<sup>277</sup> Pavel K. Baev, "Trouble-Making and Risk-Taking: The North in Russian Military Activities" in Elana Wilson Rowe (ed.), *Russia and the North* (Ottawa University Press, 2009), pp. 21–25.

<sup>278</sup> Hart et al., *Chill Out*, p. 4. See also Katarzyna Zysk, "Russia's Arctic Strategy", *Joint Forces Quarterly*, Issue 57, April 2010, pp. 107–108.

<sup>279</sup> "Putin orders Arctic military build-up in 2014", RT.com, 10 December 2013 [accessed on 21 August 2014 at <http://rt.com/news/arctic-russia-military-putin-000/>].

<sup>280</sup> "Transfer of Troops to the New Command in the Arctic Region will be Completed by December 15", ITAR-TASS, 10 December 2014, and Tim Ripley, "Russia to build more Arctic airfields", *Jane's Defence Weekly*, 21 January 2015, p. 13.

<sup>281</sup> "Machtdemonstration: Russische Fallschirmjäger landen auf Eisscholle in der Arktis", *Der Spiegel*, 7 April 2015.

<sup>282</sup> See, for example, Therese Doksheim, "Norwegian Police Intelligence Warned of Russian Information-Gathering Along Norwegian Coast", *Dagbladet.no* (Oslo), 28 February 2015.

<sup>283</sup> Stephen Blank, "The Russian Arctic: Between Economic Development and Accelerating Militarization", *Eurasian Daily Monitor*, 7 November 2014.

Alongside the impact of Russian policy, the heightened interest in the region by other non-Arctic countries (including Japan, South Korea, Singapore, India, China and Italy) introduces additional uncertainties. For most, there is a desire to learn more about global climate change, the high north being a region where its effects are most immediately evident. But each country also has specific national goals and interests that are engaged by the opening of the region and is seeking to protect those interests through active engagement. Major trading states like Japan and South Korea are interested in the potential opportunities that might present themselves should the NSR ever become commercially viable. Japan has identified the Arctic as a priority region and included it in its *Basic Plan for Ocean Policy* (2013).<sup>284</sup> Korea's president has described her country's participation in the development of the Arctic as one of the ways that it can achieve a "creative economy", and has singled out the region's energy resources in its *National Basic Energy Policy 2008-2030*.<sup>285</sup> Many commentators have suggested that Singapore fears the diversion of maritime trade from the Straits of Malacca into Arctic waters, others are more optimistic. The opening of the Arctic presents opportunities to other maritime trading countries, such as Singapore, given expertise in commercial port management and marine engineering, both likely to be in high demand if Arctic sea routes and resource development become commercially viable.<sup>286</sup>

The most notable non-Arctic state interested in the Arctic region is China. It is little different from most other non-Arctic members of the Arctic Council: Beijing is concerned about climate change and, with the world's largest merchant fleet; it is interested in commercial opportunities.<sup>287</sup> But there appears to be more to China looking north. A study published by the US Naval War College stated that "[d]espite its status as a non-Arctic country, China seems bound and determined to have a voice, perhaps even a say so, in Arctic affairs."<sup>288</sup> Beijing's Arctic policy, the author warns, "is not an evanescent fancy or passing fad, but a serious new, incipient policy direction."<sup>289</sup> Both official and academic publications claim that China is entitled to a share of Arctic resources that are regularly identified as belonging to all of humanity. In doing so, Beijing appears to be denying sovereign control of those resources to any country. "Arctic countries," an assistant minister of foreign affairs asserted in 2009, "should protect the balance between the interests of states with shorelines on the Arctic Ocean and the shared interests of the international community."<sup>290</sup> Beijing's position is likely motivated by a fear that the Arctic countries will deny China what it views as access to the region.<sup>291</sup> The buildup of China's fleet of modern icebreakers seems, in part, to be motivated by a desire to ensure that such an approach fails.<sup>292</sup>

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<sup>284</sup> Aki Tonami, *Arctic Policies of Japan, South Korea and Singapore*, (Polar Initiative Policy Brief Series - Arctic 2014: Wilson Center, September 2014), p. 2.

<sup>285</sup> Aki Tonami, "Arctic newcomers: Japan, South Korea and Singapore", *East Asia Forum* (online), 15 February 2014 [accessed on 1 May 2015 at [www.eastasiaforum.org/2014/02/15/arctic-newcomers-japan-south-korea-and-singapore/](http://www.eastasiaforum.org/2014/02/15/arctic-newcomers-japan-south-korea-and-singapore/)].

<sup>286</sup> Stewart Watters and Aki Tonami, "Singapore: An Emerging Arctic Actor" in Lassi Heininen (ed.), *The Arctic Yearbook 2012* (University of the Arctic: Akureyi, Iceland, 2012), pp. 107–109.

<sup>287</sup> Kai Sun, "Beyond the Dragon and the Panda: Understanding China's Engagement in the Arctic", *Asia Policy* Vol. 18, July 2014, pp. 46–48.

<sup>288</sup> David Curtis Wright, *The Dragon Eyes the Top of the World: Arctic Policy Debate and Discussion in China* (China Maritime Studies Institute, Naval War College, Newport, Rhode Island, 2011), p. 2.

<sup>289</sup> Wright, *The Dragon Eyes the Top of the World*, p. 32.

<sup>290</sup> Hu Zhengyue, China's assistant minister of foreign affairs, quoted in Wright, *The Dragon Eyes the Top of the World*, p. 29.

<sup>291</sup> Wright, *The Dragon Eyes the Top of the World*, p. 7.

<sup>292</sup> Wright, *The Dragon Eyes the Top of the World*, p. 32.

So far, China has been cautious in asserting its interests in the Arctic. Given the great distance involved in projecting power into the Arctic, caution is understandable. It is also politic, for while Beijing has attempted to build relations with several Arctic countries, notably Norway and Iceland (where the Chinese embassy will be the largest in that capital), suspicions surround its long-term intentions.<sup>293</sup> Russia is perhaps the most sensitive to Chinese ambitions. In early-2014, Russian officials identified China as a strategic competitor in Arctic development, and despite the closer relationship that Putin has fashioned with Beijing, the contending interests of the two Powers have not changed and will not easily be reconciled.<sup>294</sup> Like Russia, Canada's interest in asserting its sovereign rights in the polar region could also be affected by China's policy. While Beijing has not directly challenged Canadian Arctic claims, the ongoing debate in Chinese academic circles suggests that there is considerable opposition to Ottawa's perspective.<sup>295</sup>

Lastly, as climate change is opening the region to strategic competition, most countries' armed forces will find operating there extremely daunting. The extreme cold and the difficulty of ensuring adequate supply will present unique challenges for personnel and equipment, and will require an expensive infrastructure, as Canada discovered when cost-estimates for its initial Arctic military presence were revealed.<sup>296</sup> For navies, expertise developed elsewhere will not be so easily applicable there. While the opening of the Arctic is likely to be accompanied by an increased focus on underwater capabilities and operations, the conduct of modern anti-submarine operations, that require a cooperative and coordinated mission involving sub-surface, surface and aerial platforms, will prove difficult to conduct there. As a report prepared for the USN noted, “[t]his extensive and deployable ASW infrastructure that supports the principal nuclear-powered attack submarine (SSN) hunter platforms is generally deployed in the temperate oceans, but it will be challenged to operate in the Arctic. As well, the supporting tactical oceanographic data collection, analysis, and distribution system does not extend to the Arctic.” Underwater acoustics will also be of a very different, often confusing, sort from what most submariners are accustomed to confronting.<sup>297</sup> The growing strategic importance of the Arctic is likely inevitable, but the ability of states to operate there effectively is uncertain.

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<sup>293</sup> A rumoured purchase of land on Spitsbergen Island, the largest island in the Svalbard Archipelago, by a Chinese businessman with connections to the Chinese Communist Party raised concerns about Beijing's ambitions in the Arctic. See Andrew Higgins, “A Rare Arctic Land Sale Stokes Worry in Norway”, *The New York Times*, 27 September 2014.

<sup>294</sup> Wright, *The Dragon Eyes the Top of the World*, p. 5.

<sup>295</sup> Chinese commentators have suggested that discord over Canada's claim to the NWP might be solved by using the 1920 Svalbard Treaty as a model. That treaty demilitarises the Svalbard archipelago, and grants “full and absolute sovereignty” to Norway. Nevertheless, it qualifies that declaration by guaranteeing “equal liberty of access and entry for any reason or object whatever to the waters, fjords, and ports” in Svalbard to all signatory states (42 to date). Article 3 of the treaty states: “The nationals of all the High Contracting Parties shall have equal liberty of access and entry for any reason or object whatever to the waters, fjords and ports of the territories specified in Article 1; subject to the observance of local laws and regulations, they may carry on there without impediment all maritime, industrial, mining and commercial operations on a footing of absolute equality.” Interestingly, China used the 1920 agreement to establish its initial presence in the region in 2004 at the Arctic Yellow River Station in the Svalbard archipelago. See Wright, *The Dragon Eyes the Top of the World*, pp. 34–35.

<sup>296</sup> See Steve Rennie, “Arctic naval base plans scaled back after costs soared: document”, *CBC News* (online), 8 September 2014 [accessed 12 November 2014 at [www.cbc.ca/news/canada/north/arctic-naval-base-plans-scaled-back-after-costs-soared-document-1.2759743](http://www.cbc.ca/news/canada/north/arctic-naval-base-plans-scaled-back-after-costs-soared-document-1.2759743)].

<sup>297</sup> *National Security Implications of Climate Change for U.S. Naval Forces*, p. 107.

## 5 Mitigating the Challenges

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Maritime security is more than just about the sea. It embraces a range of maritime-related activities that pose risks and/or threats to states' territorial security interests.<sup>298</sup> The responses are equally broad, and include both national and international approaches to the problem. Nationally, this is evident in recent decisions by governments to enhance their maritime domain awareness by dedicating increased resources for air-, sea-, and space-based platforms and sensors.<sup>299</sup> For countries with large ocean estates (e.g., Canada, Russia, the US, Australia, India and Indonesia) the challenge is monumental and will be a work in progress for many years, if not decades. It will demand vast resources and is beyond the ability of a single agency—a navy or a coast guard—to tackle successfully. Some strategy documents—*Canada's Maritime Domain Awareness Strategy* (2011), the *UK National Strategy for Maritime Security* (2014), Washington's *Presidential Policy Directive 18: National Strategy for Maritime Security* (2012) and *National Maritime Domain Awareness Plan* (2013), as well as the *EU Maritime Security Strategy* (2014)—explicitly acknowledge that maritime security requires a whole-of-government response.

How governments will respond to their own national maritime security needs will be informed by strategic cultures, more immediate political assessments, and available resources. For some countries, particularly those traditionally sensitive about national security, a more narrow national approach, measured against the capability of other states, will be viewed as most appropriate. Russia's maritime doctrine (2001) is a case in point. It is intended “to implement and protect the interests of the Russian Federation in the oceans and the strengthening of the position of the Russian Federation among the leading maritime nations.”<sup>300</sup> Where distrust of neighbours is widespread but resources are scant, individual countries’ maritime security needs will obviously not be met, even if ambitious objectives underscore a government’s priorities. For example, the “five pillars” of Indonesia’s maritime doctrine (November 2014) understandably reflect concerns about the safety of seaborne trade routes through the country’s waters as well as protection of its marine resources.<sup>301</sup> Alternatively, the Canada-US *Beyond the Border Initiative* (2011) builds upon a longstanding and relatively transparent bilateral defence relationship. In acknowledging that their security and economies are symbiotically connected, Washington and Ottawa have adopted a continental approach to maritime domain awareness, identifying creating a process to jointly address problem areas.<sup>302</sup> That decision reflects an even earlier determination to expand the mandate of the North American Aerospace Defence Command to include a maritime warning dimension.

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<sup>298</sup> Klein, *Maritime Security and the Law of the Sea*, p. 4.

<sup>299</sup> Maritime Domain Awareness can be defined as “having true and timely information about everything on, under, related to, adjacent to, or bordering a sea, ocean or other navigable waterway. This includes all related activities, infrastructure, people, cargo, vessels, or other means of transport.” This definition is found at Transport Canada, *Maritime Domain Awareness* [accessed on 10 May 2015 at [www.tc.gc.ca/eng/marinesecurity/initiatives-235.htm](http://www.tc.gc.ca/eng/marinesecurity/initiatives-235.htm)].

<sup>300</sup> President of the Russian Federation, *Maritime Doctrine of the Russian Federation 2020* (Moscow, 2001), p. 3.

<sup>301</sup> Kessing's Record of World Events, Vol. 609, No. 11, 2014, p. 53692.

<sup>302</sup> Government of Canada, *Beyond the Border: A Shared Vision for Perimeter Security and Economic Competitiveness* (Ottawa, 2011), p. 5.

Broader-based international cooperation would most effectively contribute to addressing many of the challenges associated with maritime security and, in the coming years, governments will be confronted by issues for which multilateral approaches would be, objectively speaking, the most efficacious. That should not be surprising for, as a US thinker has recently pointed out, the diffusion of power in the international system implies a diffusion of responsibility for its management.<sup>303</sup> In an ideal world this would be so, but the grammar of international politics—and maritime security is all about politics—is defined by power, interests and values informing an individual country’s assessment of its maritime security needs that in many (perhaps even most) situations will not be shared by other countries. Consequently, there will continue to be national disagreements that will generate constraints on the most logical approaches to oceans management and this will become more evident as ocean politics intensify. Already, some commentators have observed that the “tone of maritime tensions” today is far more adversarial than it was in the 1990s.<sup>304</sup>

Regardless, international cooperation cannot be precluded in specific issue-areas. There are several examples that have already paid dividends. Counter-piracy, in particular, has witnessed international agreement on both the need and methods to be followed. In 2004, 16 countries negotiated the *Regional Agreement on Combating Piracy and Armed Robbery against Ships in Asia* (ReCAAP), the first time a binding multilateral agreement to deal with piracy was approved.<sup>305</sup> By 2015, three other countries joined, so that ReCAAP’s membership includes both regional and four European states with interests in the safety of merchant fleets operating in Asian waters. While ReCAAP’s focus is on information sharing and includes provisions for capacity building, it includes an obligation to assist in the suppression of piracy.<sup>306</sup> More globally, in December 2008 the UN Security Council endorsed the application of the *Convention for Suppression of Unlawful Acts against the Safety of Maritime Navigation*. Two weeks later, in early-2009, the Contact Group on Piracy off the Coast of Somalia (CGPCS) was created to coordinate the efforts of contributing states, international organizations, and industries concerned, on all relevant aspects of combating piracy.<sup>307</sup> A shared interest also led to Chinese, Russian, EU, Canadian, Indian, Japanese, and US naval and coast guard vessels have successfully worked together in the Indian Ocean on counter-piracy operations.<sup>308</sup> Additionally, there have been international agreements since the events of 9/11 on more focused maritime security issues, including the Proliferation Security Initiative (PSI), the Container Security Initiative (CSI) and a series of amendments to the *Safety of Life at Sea Convention* (SOLAS).

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<sup>303</sup> Charles A. Kupchan, *No One’s World: The West, The Rising Rest and the Coming Global Turn* (Oxford University Press, 2012), p. 197.

<sup>304</sup> James Manicom, “Maritime Security and the Canada-China Relationship”, OpenCanada.org, Canadian International Council, 19 March 2013 [accessed on 24 January 2014 at <http://opencanada.org/features/the-think-tank/comments/maritime-security-and-the-canada-china-relationship/>].

<sup>305</sup> Kraska, *Contemporary Maritime Piracy*, p. 145.

<sup>306</sup> Tara Davenport, “Combating Piracy and Armed Robbery in Southeast Asia: An Evolution in Cooperation”, in Nordquist et al., *Freedom of Navigation and Globalization*, pp. 37–38.

<sup>307</sup> Kraska, *Contemporary Maritime Piracy*, p. 144.

<sup>308</sup> Such cooperation can also pay national dividends. The PLA(N) has benefitted from participation in counter-piracy operations in the western Indian Ocean. In addition to enhancing the profile of the navy in the eyes of the country’s leadership, participation has provided essential training opportunities that have advanced its ability to undertake expeditionary operations. See O’Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities – Background and Issues for Congress*, pp. 29–31.

Even in areas that directly intrude upon geo-politics, the possibility exists of multilateral cooperation in the maritime sphere. Perhaps one of the most interesting recent examples is the *Convention on Unplanned Encounters at Sea* (CUES). Signed at the Western Pacific Naval Symposium in 2014, it is specifically designed to prevent unexpected at-sea aggravations between navies, particularly the USN and PLA(N), from flaring into a serious international confrontation with unforeseen consequences. CUES might, therefore, be regarded as a form of pre-crisis management. It is intended to reduce the possibility of miscalculations and unintended escalation at sea and is “a non-binding voluntary agreement to follow set procedures for communicating with other military forces encountered at sea or in the air.”<sup>309</sup> At the tactical level, it creates a safer operating environment by helping to make certain that intentions of naval vessels and/or fleets are not misunderstood. At the strategic level, it is useful in maintaining open channels of communication at a time when tensions in Asian waters are rising and naval forces might be unfamiliar with one another. By reducing the potential for escalation, CUES is widely regarded as a success by translating tactical confidence into strategic stability.

The possibility of finding common ground on all, or even the most, pressing maritime problems is nonetheless precluded by the immensity of the maritime realm, the complex issues that need to be addressed, and the breadth of contending interests among states. Efforts at comprehensive regulation—e.g., in the Mediterranean Sea or among the members of the Association of Southeast Asian Nations (ASEAN)—have so far failed due to a broad array of conflicting economic interests, national sensitivities or mutual distrust.<sup>310</sup> ASEAN and its subsidiary bodies (e.g., the ASEAN Maritime Forum—AMF, ADMM+—ASEAN Defence Ministers Meeting Plus, and the ASEAN Regional Forum—ARF), to select one multilateral organization, have gone far in institutionalizing dialogue and information exchanges, but far less progress has been made in the areas of effective cooperation on maritime security-related items and joint enforcement.<sup>311</sup> The *Declaration on the Conduct of Parties in the South China Sea* (2002), between ASEAN member-states and China is one such example.<sup>312</sup> Its formal adoption is generally regarded as a positive contribution towards dampening regional tensions, but its application has proven more difficult.<sup>313</sup> While the positive outcome of the negotiations is important and might even have a salutary impact on regional politics, the reliability of any international confidence-building mechanism flows directly from its practical utility. In this case, the clash of exclusive national interests, namely maritime boundaries is reinforced by the enormous asymmetry between China and the other members of ASEAN.<sup>314</sup>

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<sup>309</sup> Ankit Panda, “Unplanned Encounters in the South China Sea?”, *The Diplomat*, 25 January 2016.

<sup>310</sup> United States Senate, Committee on Foreign Relations, *Re-Balancing the Rebalance: Resourcing U.S. Diplomatic Strategic in the Asia-Pacific Region – A Majority Staff Report* (Washington, D.C., 2014), pp. 19–20. See also Holslag, *Crowded, Connected and Contested – Security and Peace in the Eurasian Sea and What it Means for Europe*, p. 13.

<sup>311</sup> See Hao Duy Phan, “Institutional Building for Maritime Security in Southeast Asia: The Bodies of ASEAN”, in Nordquist et al., *Freedom of Navigation and Globalization*, pp. 167–186.

<sup>312</sup> Association of Southeast Asian Nations, *Declaration on the Conduct of Parties in the South China Sea*, 4 November 2002 [accessed on 15 April 2015 at [www.asean.org/asean/external-relations/china/item/declaration-on-the-conduct-of-parties-in-the-south-china-sea](http://www.asean.org/asean/external-relations/china/item/declaration-on-the-conduct-of-parties-in-the-south-china-sea)].

<sup>313</sup> Shen Dengli, “Positive Steps in the South China Sea”, *The Diplomat*, 2 August 2011.

<sup>314</sup> Shannon Tiezzi, “Why China Isn’t Interested in a South China Sea Code of Conduct”, *The Diplomat*, 26 February 2014.

Maritime security is not the only area where multilateral efforts have encountered resistance, as the trend regarding ecological initiatives is not entirely positive. In some cases, widely-supported initiatives have encountered often decisive opposition, particularly when it concerns imposing some form of international legal control over portions of the high seas. At present, approximately 12 percent of the Earth's surface is protected by environmental legislation, while only one percent of the oceans enjoy a similar level of legal coverage. The UN Conference on Biological Diversity set a target in 1997 of having 10 percent of the oceans protected by 2012. By the end of 2011, only 1.6 percent had been achieved and most of the existing maritime protection areas are small and near coastlines.<sup>315</sup> It will be far more difficult to obtain agreement on such zones on the high seas. In March 2015, the British government established an 830,000 square kilometre marine reserve around Pitcairn Island in the Pacific.<sup>316</sup> That was, however, the decision of a single national authority. With regard to obtaining international accord, the results are less convincing. In 2014, negotiations within the Commission for the Conservation of Antarctic Marine Living Resources to create the world's largest marine sanctuary failed when China and Russia objected to catch limits on a number of fish species, including krill, which are important in local food chains.<sup>317</sup> As climate change opens the polar seas to navigation—safer and sustained—it is an open question if internationally recognized special protections for these sensitive ecological regions will be negotiable, or if extant (e.g., under UNCLOS), upheld in practice.

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<sup>315</sup> Roberts, *Oceans of Life*, p. 305.

<sup>316</sup> Pew, "National Geographic Applaud Creation of Pitcairn Islands Marine Reserve", *PR Newswire*, 18 March 2015 [accessed on 25 March 2015 at <http://www.prnewswire.com/news-releases/pew-national-geographic-applaud-creation-of-pitcairn-islands-marine-reserve-296729591.html>].

<sup>317</sup> "Russia, China Reject World's Largest Marine Sanctuary", *Sea Technology*, December 2014, p. 68.

## **6 The Role of Navies**

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What is the role of navies in this discussion? How does naval power relate to the rapidly changing maritime environment? Such questions are warranted and necessary for, as a senior member of the International Maritime Organisation has recently written, “[t]here does seem to be an almost existential crisis around the question of what navies are for.”<sup>318</sup> It is perhaps easiest to observe that navies exist to support government policy. Indeed, they are foremost an instrument of policy and, as a result of the range of capabilities and platforms they possess, navies are remarkably agile in addressing that requirement.<sup>319</sup> A fleet with modern, combat-capable surface ships and submarines guarantees that it is able to conduct a full range of missions, from domestic-oriented operations, to coercive diplomacy and to armed conflict. With at-sea support, its ships are largely self-sustaining, are able to be forward deployed for long periods of time, and can rapidly re-role from one type of mission to another. Their ability to remain on station (often in international waters) means that warships also have flexibility as a policy instrument that is not available to ground and air forces. Nevertheless, it has been suggested that the overall utility of navies has less to do with specific missions—defending trade or providing security for SLOCs or for counter-piracy—but rather flows from an indirect contribution to international stability.<sup>320</sup> That argument poses a serious challenge to the dominant narrative regarding the role of navies—but it need not be so. For, despite the absence of any major fleet engagements since the end of the Second World War, navies have always been very active. Even in peacetime, they do lots of different missions. Taking into account the role of navies and naval power in the contemporary era and likely in the decades to come requires, therefore, a broad perspective.<sup>321</sup>

### **6.1 The Constabulary Role, Cooperation and Capacity Building**

Given the expanding demands of maritime security, a focus by some navies on constabulary functions will continue for many decades to come and could even intensify. These tasks include search-and-rescue, environmental protection, prevention of pollution, counter-piracy, fisheries enforcement, as well as interdicting narcotics traffic at sea and illegal migration. Many of these functions will be exercised in territorial waters. In such circumstances, countries such as the US or China, will continue to rely on coast guards. Indeed, under existing law, the US Coast Guard (in peacetime an agency of the Department of Homeland Security) is the lead agency for maritime homeland security for which the USN might on occasion be called upon to support.<sup>322</sup> In certain circumstances, it is not just a matter of dividing responsibilities, for a government’s reliance on a

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<sup>318</sup> Chris Trelawny, “Maritime Security Beyond Military Operations: A Civilian Perspective”, *RUSI Journal*, February/March 2013, p. 51.

<sup>319</sup> Hew Strachan, *The Direction of War; Contemporary Strategy in Historical Perspective* (Cambridge University Press, 2013), p. 157.

<sup>320</sup> This argument is made in James de Waal, “The utility of naval power”, *Jane’s Navy International*, January/February 2015, p. 12.

<sup>321</sup> This expansive view has led one author to write that navies can legitimately be understood as “the backstop of national security.” See David Blagden, “Sea Power is Benign Power”, *The RUSI Journal*, Vol. 159, June 2014, p. 55.

<sup>322</sup> The USN is, for example, the lead agency for dealing with mine counter-measures. See Scott C. Truver, “Mines and Underwater IEDs in U.S. Ports and Waterways”, *US Naval War College Review*, Vol. 61, No. 1, Winter 2008, pp. 112–114.

coast guard can sometimes provide greater flexibility to policymakers than would be the case were naval forces deployed. China's reliance on its large and capable coast guard to exercise what are essentially constabulary functions in the East China Sea is one such example. It allows Beijing to avoid military-to-military confrontations.<sup>323</sup> Non-military competition using coast guards or maritime law enforcement vessels—e.g., between Japan and China over the disputed Diaoyu/Senkaku Islands—creates breathing room in times of heightened tensions, and prevents inevitable escalation that would likely follow were naval forces engaged in this form of brinkmanship.

For most countries, however, navies will retain an important or leading role in asserting (often merely through presence) legitimate national authority in both sovereign waters and within EEZs. Governments will also continue to use their navies as an instrument for cooperative diplomacy. Humanitarian assistance and disaster relief missions, such as those conducted in response to the tsunami in East Asia (2004) or earthquake in Haiti (2010), are regularly used not only to alleviate human suffering, but are also intended to augment a country's soft power.<sup>324</sup> And, navies will be used to forge coalitions to improve regional maritime domain awareness, as in North America or among EU member-states, or to help develop essential maritime security capabilities among less-developed countries. Described as partnership-centric, the latest version of the US government's maritime strategy, *A Cooperative Strategy for 21<sup>st</sup> Century Seapower* (2015), places considerable importance on cooperative capacity building. In discussing the global role of the USN it asserts, for example, that "[m]erging our individual capabilities and capacity produces a combined naval effect that is greater than the sum of its parts. By working together in formal and informal networks, we can address the threats to our mutual maritime security interests. Maximizing the robust capacity of this global network of navies concept, we are all better postured to face new and emerging challenges."<sup>325</sup> This is, of course, the thinking behind such USN-led multilateral exercises as Rim of the Pacific (RIMPAC) and UNITAS, and multilateral gatherings such as the Western Pacific Naval Symposium (WPNS). Enhancing national naval capability through frequent international contact and cooperation also contributes to decisions by countries to deploy naval assets in support of allies and/or partners (e.g., the UK naval task group in the Arabian Sea). But it need not be multilateral, for governments will also use naval capacity building to advance strictly bilateral relationships. In 2007, for example, China transferred nine patrol boats to Cambodia only three months after Phnom Penh announced its intention to improve the security of its offshore oil production facilities. The timing of this gesture was reportedly very much appreciated by the Cambodian authorities.<sup>326</sup> While advancing foreign policy objectives, support for maritime capacity building using navies can also be a key enabler in helping "to provide greater maritime security as a building block for greater stability on land."<sup>327</sup>

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<sup>323</sup> See Ryan D. Martinson, "China's Second Navy", *Proceedings of the United States Naval Institute*, April 2015, pp. 24–29.

<sup>324</sup> Soft power can be defined as "the ability to get what you want through attraction rather than coercion or payments. It arises from the attractiveness of a country's culture, political ideals, and policies. When our policies are seen as legitimate in the eyes of others, our soft power is enhanced." Joseph S. Nye, *Soft Power. The Means to Success in World Politics* (Public Affairs: New York, 2004), p. x.

<sup>325</sup> *A Cooperative Strategy for 21<sup>st</sup> Century Seapower*, p. 2. See also Sam J. Tangredi, "US Navy Efforts in Supporting Partner Maritime Capacity Building: Refocusing a Tradition", in Forbes (ed.), *Maritime Capacity Building in the Asia-Pacific Region*, pp. 41–52.

<sup>326</sup> Evans, "Enforcing Free Trade."

<sup>327</sup> Trelawny, "Maritime Security Beyond Military Operations: A Civilian Perspective", p. 51.

The Royal Canadian Navy (RCN) is an example of a navy that conducts constabulary roles. Given Canada's enormous ocean estate, the RCN is routinely tasked to conduct sovereignty patrols, contribute to maritime domain awareness, and provide a seaborne presence to deter those contemplating illegal or hostile activities in Canadian waters. It works with the Canadian Coast Guard in support of maritime search and rescue (SAR), and also supports the Royal Canadian Air Force in its air SAR. When required, it will assist other Canadian federal government departments, and supports civil authorities at all levels of government, a recent example of which was the RCN's role in assisting with the provision of security to the 2010 Vancouver Olympic and Paralympic Games. The Navy's constabulary role has also influenced the planned acquisition of Arctic/Offshore Patrol Ships which have been designed to facilitate greater access and presence in the country's Arctic waters. The RCN's experience is, of course, not unique. Globally speaking, there appears to be greater interest by governments in navies performing such duties. Seeking enhanced maritime domain awareness, providing assistance to other government departments in meeting their responsibilities in the maritime sphere as well as protecting national authority and the rule of law in offshore waters are of greater political importance. The significance of constabulary functions is also reflected in worldwide naval procurement. According to a US naval analyst, of the 1,700 warships built worldwide in recent years, most were "smaller patrol vessels and corvettes designed to aid coastal states in controlling their EEZ" or "super-quiet diesel submarines that operate closer to shore."<sup>328</sup>

## 6.2 Naval Diplomacy<sup>329</sup>

As an instrument of state power, navies are able to advance national policy in ways that are not available to other branches of the armed services. Most obviously, they can undertake what one author has termed persuasive diplomacy—"increasing recognition of one's maritime or national power" and by doing so enhance national prestige. The best historical examples are probably the use of Royal Navy warships of all classes to impress allies and adversaries alike with its command of the seas. The annual Spithead Review at the turn of the 20<sup>th</sup> century is one such example, as are the frequent port visits using the most powerful battleships during the Interwar Era to shore up Britain's international policies and demonstrate the Empire's global reach and influence.<sup>330</sup> There are many more recent examples. The February 2011 passage of an Iranian naval force through the Suez Canal, ostensibly to conduct a port visit in Syria, Iran's closest ally, was the first time since 1979 that Tehran sent its ships on such a voyage. It signalled to all of the regional Powers, including the US, that Iran was able to project power beyond its territorial waters.<sup>331</sup> Several months after the US deployed ships into the Black Sea during the Russo-Georgian war (August 2008), Russia dispatched a four ship naval flotilla to conduct maneuvers in the Caribbean.<sup>332</sup> Posing a direct

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<sup>328</sup> Kraska, *Maritime Security and the Law of the Sea*, p. 12.

<sup>329</sup> For much of the thinking in this section, I am indebted to Christian Le Miere, *Maritime Diplomacy in the 21st Century: Drivers and Challenges* (Routledge: New York, 2014).

<sup>330</sup> *The Times* (London) reported on the 1897 Spithead Review and described the Royal Navy as "the most powerful and far-reaching weapon that the world has ever seen." That was clearly the intent of the review. See Rhodri Williams, *Defending the Empire: The Conservative Party and British Defence Policy, 1899-1915* (Yale University Press: New Haven, 1991), p. 27.

<sup>331</sup> For the immediate reaction, particularly in Israel, see Isabel Kershner, "Israel Silent as Iranian Ships Transit Suez Canal", *The New York Times*, 22 February 2011.

<sup>332</sup> R. Evan Ellis, *Russian Engagement in Latin America and the Caribbean: Return to the 'Strategic Game' in a Complex Interdependent Post-Cold War World?* (Strategic Studies Institute, US Army War College: Carlisle Barracks, Pennsylvania, 24 April 2015), p. 2.

threat to the US from within Washington’s traditional sphere of influence was probably less important in Moscow’s calculations than revealing the ability to do so. And, indeed, it is more than probable that the US was not the only intended audience as Russia likely also wanted to augment its profile in Latin America and the Caribbean.

The purpose of such demonstrations using naval forces—in the past and now—is not to alter a government’s specific policy. It demonstrates that a naval force can arrive at a putative adversary’s maritime doorstep or that a country has an interest in developments in a particular region. In 1973, for example, Operation Westploy saw the RCN deploy a destroyer in support of Canadian participation in the International Commission for Control and Supervision, an international force mandated to monitor the enforcement of the Paris Peace Agreement in Vietnam.<sup>333</sup> Use of navies for this purpose by even the most powerful countries will continue, as one sees in the global voyage of the PLA(N)’s *Zheng Ho* and the longstanding forward deployment of US carrier battle groups. It is entirely probable that such deployments will become more frequent as non-traditional maritime Powers seek to demonstrate their newly-acquired naval prowess, including an ability to operate further and further away from home waters.

Coercive diplomacy is the obverse of persuasion, but the effectiveness of both is inextricably linked to the actual capabilities of the naval vessels as warships. The use of naval power to attempt to force a change in another government’s policy or to protect interests abroad is very well-known. One writer has recently written that “[d]espite the vast changes that have taken place in the world since the mid-Victorian era, the coercive role that a navy—whether great or small—can perform in peacetime against a littoral state has survived virtually intact.”<sup>334</sup> There are also, as one might expect, many examples of this use of naval power. The initial step in the opening of Japan was accomplished in 1853 by Commodore Perry and his “black ships”, a USN squadron that he anchored despite strong Japanese objections in Uraga Harbour near Edo (Tokyo). Washington sent the USS *Enterprise* into the Bay of Bengal during the Indo-Pakistani War (December 1971) in order to protect its interests and, in 1996, deployed two carrier battle groups to the Taiwan Strait to reassure Taiwan during a crisis in its relations with Beijing.<sup>335</sup>

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<sup>333</sup> Information on Westploy can be found on the website of Canada’s Department of National Defence. See [www.cmp-cpm.forces.gc.ca/dhh-dhp/od-bdo/di-ri-eng.asp?IntlOpId=68&CdnOpId=78](http://www.cmp-cpm.forces.gc.ca/dhh-dhp/od-bdo/di-ri-eng.asp?IntlOpId=68&CdnOpId=78).

<sup>334</sup> Malcolm Murfett quoted in Till, *Seapower – A Guide for the Twenty-First Century*, p. 233.

<sup>335</sup> A positive outcome of coercive diplomacy is never assured and can generate shockwaves that last for years afterward. See George Gilboy and Eric Heginbotham, *Chinese and Indian Strategic Behavior: Growing Power and Alarm* (Cambridge University Press, 2012), pp. 58–59. The deployment of the USS *Enterprise* failed to prevent the defeat of Pakistan, Washington’s ally, and led Indian policy-makers and strategists to put a new emphasis on the development of sea denial capabilities (e.g., submarines) and led to new naval procurement from the Soviet Union. See Stephen P. Cohen and Sanil Desgupta, *Arming Without Aiming: India’s Military Modernisation* (Brookings Institution: Washington, D.C., 2010), pp 75–76. One author has argued that in this case US gunboat diplomacy humiliated India and encouraging it to boost its nuclear weapons programme. Summit Ganguly, “Pakistan’s Forgotten Genocide – A Review Essay”, *International Security*, Vol. 39, No. 2, Fall 2014, p. 178. With regard to the 1996 Taiwan Strait Crisis, the US decision to deploy the two carriers to offset Beijing’s pressure on Taiwan proved to be a rationale for Chinese naval modernisation and expansion. “Specifically, [the] inability of the PLA to detect US carrier battle groups, monitor operations near the Asian mainland, and deter or strike US power-projection forces, spurred Chinese modernization. After this event, it became apparent that the capabilities of China to coerce Taiwan were inadequate.” Thomas G. Mahnken, “Arms Races and Long-Term Competition”, in Mahnken and Blumenthal (eds.), *Strategy in Asia*, p. 231. See also Douglas Porch, “The Taiwan Strait Crisis of 1996; Strategic Implications for the United States Navy”, *Naval War College Review*, Summer 1999, pp. 15–48.

More recently, a Chinese naval frigate purportedly locked its fire control radar on a Japanese destroyer in seas near the disputed Senkaku/Diaoyu Islands in the East China Sea.<sup>336</sup> Interpreting the move as threatening, Japanese officials saw it as an attempt to force Tokyo to accept that a territorial dispute exists, a position Japan currently rejects. Often referred to as “gunboat diplomacy”, the long-held view that naval coercion could only be utilised by states is now regarded as inaccurate. In recent years both separatist groups (e.g., the Liberation Tigers of Tamil Eelam in Sri Lanka) and supra-national organizations (e.g., the European Union deploying the multinational EU Naval Force off Somalia in 2012) have resorted to its use.<sup>337</sup>

Coercive diplomacy at sea will continue in the new century and, as maritime issues generate new disputes, will almost certainly grow in frequency and intensity. That states will resort to employing navies for coercive diplomacy underscores the utility of maritime forces in signalling intent and in using armed force in situations short of war.<sup>338</sup> In a way unavailable to governments that are reliant on air and land forces, naval coercive diplomacy will often prove to be a highly effective and celebrated mechanism for escalation control and diplomatic signalling (to friend and foe) during international crises.

### 6.3 War at Sea

In the future, as in centuries past, those governments seeking to protect their countries from sea-based threats will continue to maintain naval forces to deter inter-state conflict and asymmetric attacks by non-state actors. In that, there is nothing particularly new and the most valuable (politically and strategically) naval forces continue to be the most agile and multi-purpose. Throughout history, navies have been used to control the sea lines of communication, in order to protect commerce or to disrupt that of an adversary/enemy, and to transport military forces or to prevent an enemy from moving or supplying his troops. That will not change as the current century unfolds. The possession of sea power is intended to provide strategic options to governments in order to induce behaviour among putative adversaries so as to advance strategic interests. Navies are particularly useful in meeting this need because platforms and capabilities most frequently employed for maritime domain awareness or naval diplomacy often overlap with those required for national defence and armed conflict in distant seas.

Unlike war on land, war at sea is neither focused on the occupation of territory nor does it always require the destruction of an adversary’s force. Indeed, it is conceivable that a navy can contribute to victory in war without a large-scale naval battle ever taking place. The Battle of Trafalgar (1805) did not guarantee Britain’s victory over Napoleon, but it did guarantee that Britain could not be invaded and defeated on land by France. The Battle of Jutland (1916) might be considered a tactical defeat given that the Royal Navy lost more ships than did its German opponent. It was, however, a strategic victory, for it ensured that British sea lines of communication were protected, that the naval blockade of Germany would be maintained, and that Great Britain could continue to support France in waging war on the European mainland. The Battle of Midway (1942) did not make US victory over Japan inevitable, but it decisively reduced Tokyo’s ability to prevent that from happening. As the historical record suggests, while wars cannot be won by sea power alone,

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<sup>336</sup> Martin Fackler, “Japan Says China Aimed Military Radar at Ship”, *The New York Times*, 5 February 2013.

<sup>337</sup> Christian Le Miére, *Maritime Diplomacy in the 21<sup>st</sup> Century; Drivers and Challenges* (Routledge: London, 2014), p. 17.

<sup>338</sup> Le Miére, *Maritime Diplomacy*, p. 123.

a maritime Power *could* lose a military contest as a result of naval defeats.<sup>339</sup> As British naval strategist Geoffrey Till has written, “[b]attles do matter, even in today’s apparently very different world.”<sup>340</sup>

In war, the strategic role of naval power is often indirect but it need not be. Blockading an enemy fleet in port or deterring it from entering a theatre of operations, as happened to the Argentine Navy during the Falklands War after the sinking of the *General Belgrano*, are often just as effective as a naval engagement.<sup>341</sup> So, too, is the concept of the fleet-in-being that purposely avoids conflict but, by remaining intact (and even sometimes in port), poses a latent threat that must be neutralized, thereby requiring an opponent to divert naval and air resources that are almost always needed elsewhere. And, while navies are not inherently a joint capability, they very often are and will continue to be called upon to play that role in support of operations ashore. Many of the operations (combat and HADR) of the past two decades – in Europe (the Balkans, Georgia and Crimea), the Middle East (Iraq and Libya), in Africa (Sierra Leone), Afghanistan, and in response to disasters in Haiti and Indonesia – all had operationally significant naval contributions. In terms of the combat operations in both Libya and Crimea, the naval contribution was arguably essential to mission success. A navy helps define the operational context within which land warfare can take place.

Today, it is fashionable to argue that neither war on the high seas nor fleet-on-fleet engagements is likely. The last great battles at sea were fought seventy years ago, so such an assumption is understandable. It is not, however, grounded in an appreciation of even recent history. During the Cold War, NATO and the Warsaw Pact assumed that open ocean war would occur. Both sides saw the trans-Atlantic sea link that NATO’s defence strategy depended upon as an acute vulnerability, and surface and sub-surface platforms, as well as naval aviation, were deployed by both sides. Today, a similar dynamic is evident, and the expansion of regional navies, especially in Asia, suggests that countries view at-sea confrontation as possible, perhaps even likely, in the event of armed conflict. The growth of naval forces that enhance national deterrent capabilities increases the capacity to wage war at sea (as well as from the sea) and, perhaps, also underwrites a greater willingness to consider doing so. In the coming decades, it is reasonable to assume that the strategic reach and sophistication of some of these navies will continue to grow. Some of that modernization, particularly in Asia, is being driven by the national ambitions of increasingly affluent countries. Possession of a modern navy has often been seen as a symbol of a modern country. But in an era of strategic uncertainty, many governments believe they have no real option but to expand their naval capabilities in order to deter likely adversaries (either alone or as a member of a coalition of like-minded states). As countries continue to invest in modern warfighting capabilities, naval planners will confront a maritime strategic environment in which the return of major conflict at sea is increasingly probable.<sup>342</sup>

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<sup>339</sup> Julian Corbett, *Some Principles of Maritime Strategy* (Naval Institute Press: Annapolis, Maryland, 2011), p. 15.

<sup>340</sup> Geoffrey Till, *Understanding Victory – Naval Operations from Trafalgar to the Falklands* (Praeger: Santa Barbara, California, 2014), p. 189.

<sup>341</sup> Geoffrey Till, *Seapower – A Guide for the Twenty-First Century* (Routledge, 2013), pp. 182–183.

<sup>342</sup> Joseph Henrotin, *Les Fondements de la Stratégie Navale au XXIe Siècle* (Economica: Paris, 2011), p. 442.

## 6.4 Sea Control and Sea Denial<sup>343</sup>

Regardless of where a naval confrontation takes place, sea control must always be an aiming point for navies.<sup>344</sup> As Till has argued, sea control “confers tremendous benefits”, for in its acquisition and exercise it allows a navy to carry out an operation without serious challenge from an opponent.<sup>345</sup> Sea control is the ability to control a defined area of the sea that is operationally significant, and thereby ensure freedom of action through operational manoeuvre to undertake a variety of duties.<sup>346</sup> For traditional maritime Powers (e.g., US, UK and France), this includes gaining access to a theatre of operations; protecting SLOCs; projecting power ashore; contributing to land operations, and; establishing a sea-base to support follow-on forces.<sup>347</sup> For other countries, pursuit of sea control while involving fewer resources might be equally intended to maximize strategic advantage, from asserting sovereignty to domination of a strategic waterway to making an effective (i.e., positive) contribution to a coalition force. In the open ocean, sea control is pursued in a mobile setting. In the littorals, it is fixed geographically and is potentially more complex, with threats emanating from air, land as well as on and under the sea, from cyber and space, and from state and increasingly non-state actors. In all cases, projecting power using naval platforms requires the ability to protect (using ship-based sensors and weapons) and to sustain those assets, and those they are escorting—a core concern in joint operations—both as they transit to where they are needed and when in theatre.

Whenever it is sought, sea control will face adversaries seeking to achieve the same aim or to prevent its acquisition by another. Sea denial<sup>348</sup> has sometimes led to the construction of large battle fleets (the USSR), but most often the approach has been asymmetric (modern day Iran). Generally speaking, when a navy is not powerful enough to confront its adversary, it will often attempt “delay, disruption, denial and demoralisation” in an effort to persuade a more powerful opponent to abandon its operation.<sup>349</sup> It is generally believed that this is the thinking today in countries, such as Iran and China, and it is the rationale behind the US concepts for overcoming modern anti-access strategies.<sup>350</sup> But, of course, any effort to counter an anti-access strategy must be dynamic, for sea denial is neither static nor is it fixed geographically. China’s naval buildup is gradually expanding the maximum distance of possible operations for the PLA(N) to more than

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<sup>343</sup> This section benefited from ideas and concepts found in Milan Vego, *Operational Warfare at Sea* (Routledge: New York, 2008) and Geoffrey Till, *Seapower*, Third Edition (Routledge: New York, 2013).

<sup>344</sup> Canada’s *Defence Terminology Bank* (Record 18990) defines sea control as “[t]he condition that exists when one has freedom of action within an area of the sea for one’s own purposes for a period of time in the subsurface, surface and above water environments.”

<sup>345</sup> Till, *Seapower at the Millennium*, p. 2.

<sup>346</sup> Milan Vego, *Operational Warfare at Sea* (Routledge: London, 2009), p. 30.

<sup>347</sup> *Horizon 2050: A Strategic Maritime Concept for the Canadian Forces*, p. 26.

<sup>348</sup> The *Defence Terminology Bank* (Record 18986) defines sea denial as “[p]reventing an adversary from controlling a maritime area without being able to control that area oneself.”

<sup>349</sup> Robert C. Rubel, “Talking About Sea Control”, *Naval War College Review*, Vol. 63, No. 4, Autumn 2010, p. 41.

<sup>350</sup> For an overview, see Andrew Krepinevich, *Why AirSea Battle?* (Center for Strategic and Budgetary Analysis: Washington, D.C., 2010), pp. 13–26 and General Norton A Schwartz and Admiral Jonathon W. Greenert, “Air-Sea Battle”, *The American Interest*, 20 February 2012 [accessed on 21 February 2012 at [www.the-american-interest.com/article.cfm?piece=1212](http://www.the-american-interest.com/article.cfm?piece=1212)]. See also Sam J. Tangredi, *Anti-Access Warfare: Countering A2/AD Strategies* (Naval Institute Press: Annapolis, 2013).

1,000 miles, from which, one assumes, Beijing hopes to deny access to an adversary's navy.<sup>351</sup> And, interestingly, sea denial need not always be the strategy of the weak. Traditional naval Powers might even have recourse to a regional sea denial strategy in order to confront a local threat using land, air and naval forces while concentrating fleet assets and conducting operations elsewhere. Indeed, some writers have suggested that the US adopt such an approach either to bottle up the PLA(N) or to prevent an invasion of Taiwan by adopting an anti-access strategy that would effectively counter Chinese superiority in that theatre.<sup>352</sup> Last, in littoral waters, asymmetric players (i.e., non-state actors and/or terrorists) expand the challenge posed to sea control, for the threat is often embedded in civilian populations making it difficult to confront and neutralize.

Modern technology reduces both the difficulty and the cost of a sea denial strategy and, in doing so, enhances the ability of smaller navies and irregular forces.<sup>353</sup> This is evident with the growing reliance on space-based sensors, precision-guided munitions (including cruise missiles), maritime strike aircraft, unmanned vehicles and, most recently, with the ongoing development and procurement of shore-, sea- and air-launched anti-ship ballistic missiles.<sup>354</sup> Anti-ship ballistic missiles are a particularly worrisome development since they have the capability, at relatively low cost, of striking platforms such as aircraft carriers that traditional naval Powers have long relied on for power projection.<sup>355</sup> All of these technologies have greatly expanded the geographic range in which the contest for sea control will occur.

#### 6.4.1 Submarines

In a White Paper prepared by NATO's Allied Submarine Command, submarines are described as "arguably the most efficient fighting ships that have ever been developed. Inherently covert, mobile, highly persistent and invoking the potential for overwhelming lethality, submarines contribute to national security across the spectrum of peace, crisis and war."<sup>356</sup> They are also,

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<sup>351</sup> Andrew Erikson, "China's Modernization of its Naval and Air Power Capabilities", Ashley J. Tellis and Travis Tanner (eds.), *Strategic Asia 2012-2013; China's Military Challenge* (National Bureau of Asian Research: Washington, D.C., 2012), pp. 61–62.

<sup>352</sup> Tangredi, *Anti-Access Warfare: Countering A2/AD Strategies*, pp. 175–76. See also Jan van Tol, *Air-Sea Battle: A Point of Departure Operational Concept* (Center for Strategic and Budgetary Assessments: Washington, D.C., 2010) that calls for the development and deployment by the US of smart sea mines.

<sup>353</sup> Sea denial strategies have been practised throughout history by smaller Powers, and they do not need to draw upon naval platforms or capabilities. The forts that guarded the entrance to the Dardanelles and thwarted the initial Anglo-French naval assault on the Turkish Straits in 1915 are a good example of this. For a concise history of that campaign, see Paul Halpern, *A Naval History of World War I* (Naval Institute Press: Annapolis, Maryland, 1994), pp. 109–123. More recently, Tangredi discusses the Dardanelles campaign in his study of A2AD warfare. See *Anti-Access Warfare: Countering A2/AD Strategies*, pp. 117–123.

<sup>354</sup> China's new anti-ship ballistic missile (the DF-21D) is of concern to the US Navy as a result of its potential lethality as well as it being the perfect example of an asymmetric weapon. "China might be willing," one US analyst has stated, "to expend hundreds of ASBMs (with an estimated cost of \$25 million) in a saturation attack to destroy or "mission kill" a single aircraft carrier (valued \$10 – 15 billion) – essentially a "brute force" approach to compensate for its battle network limitations." See "Statement by Jim Thomas, Vice President, Center for Strategic and Budgetary Assessments", *Hearing before the Seapower and Projection Forces Subcommittee*.

<sup>355</sup> O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities – Background and Issues for Congress*, pp. 7–9.

<sup>356</sup> NATO, International Military Staff, SH/J3/SPOPS/MAO/FO/14-305105, *Submarine White Paper – Submarine Performance in a Complex Battle Space*, 20 January 2014 (unclassified).

quite possibly, the sea denial capability most frequently cited in naval literature. Alongside its ‘stealthiness’ and ability to access and operate in areas other naval platforms cannot, the attention paid to submarines is also due in large measure to their proliferation (an increase of 50 percent in the last decade<sup>357</sup>) especially among navies in Asia. Nearly every Asian country with a coastline is acquiring new, or modernizing existing, submarine fleets.<sup>358</sup> In the open oceans or in an adversary’s waters, submarines are formidable weapons and very capable ISR assets, and the most effective counter is another submarine. In confronting a more powerful fleet, a modern submarine is a serious threat as a sea denial platform. Stealthy in operations, and hard to hunt and kill, it has an enormous deterrent capability. Moreover, new technology has increased its stealthiness. Rumors of an enemy submarine where a naval operation is being contemplated will immediately alter the assessment as to the ability to acquire and exercise sea control. The deployment of a Royal Navy submarine in the South Atlantic in 1977 purportedly deterred an invasion by Argentine military forces that occurred five years later when no such platform was present in those waters.<sup>359</sup>

In Asia, the growth of submarine fleets is not a case of China against everyone else, as one might assume, but the expansion of the PLA(N)’s sub-surface capabilities is a major driver. Chinese naval doctrine supports the continued acquisition of modern diesel-electric and relatively inexpensive attack submarines, many of which will likely be armed with anti-ship cruise missiles.<sup>360</sup> A 2009 assessment by the US Office of Naval Intelligence, stated that “since the mid-1990s, [China] has emphasized the submarine force as one of the primary thrusts of its military modernization effort.”<sup>361</sup> That a desire for an enhanced sea denial capability is informing this build-up is widely accepted. Chinese naval thinking explicitly views the submarine force as a means of denying the USN sea control in the Western Pacific and, by doing so, to prevent Washington from exercising strategic influence in areas that Beijing regards as its sphere of influence. This is particularly important as defeating (or, at the very least, credibly threatening to defeat) US aircraft carriers is essential if China wants to effectively implement sea denial in the face of US efforts to project power in any crisis related to Taiwan. As one analyst has recently written, the PLA(N) wants to ensure that US naval forces find themselves “in a highly contested environment long before they reach their destination.”<sup>362</sup> US naval planners are also now very acutely aware that the sophistication of China’s submarine capability is growing, as was

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<sup>357</sup> Sam Bateman, “Perils of the Deep: The Danger of Submarine Proliferation in the Seas of East Asia”, *Asian Security*, Vol. 7, No. 1, 2011, pp. 61–84.

<sup>358</sup> Eric Talmadge, “Battle for control of Asia’s seas goes underwater”, *Associated Press*, 19 January 2012.

<sup>359</sup> Sloggett, *The Anarchic Sea*, p. 11.

<sup>360</sup> George J. Gilboy and Eric Heginbotham, *Chinese and Indian Strategic Behavior* (Cambridge University Press, 2012), p. 141. See also Benjamin Schreer, “Australia: China’s emerging undersea capability and the implications for Australia’s future submarine”, *The Strategist*, 24 April 2014, and William S. Murray, “An Overview of the PLA(N) Submarine Force” in Andrew S. Erikson, Lyle J. Goldstein, William S. Murray and Andrew R. Wilson (eds.), *China’s Future Nuclear Submarine Force* (Naval Institute Press: Annapolis, Maryland, 2007), pp. 59–76.

<sup>361</sup> The ONI report is quoted in O’Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities – Background and Issues for Congress*, p. 10.

<sup>362</sup> Montgomery, “Contested Primacy in the Western Pacific: China’s Rise and the Future of U.S. Power Projection”, p. 137. See also James R. Holmes and Toshi Yoshihara, *Chinese Naval Strategy in the 21<sup>st</sup> Century* (Routledge: London, 2008), pp. 94–95. For a short summary of Chinese naval doctrine and its buildup, see Andrew Erikson and Gabe Collins, “China’s Real Blue Water Navy”, *The Diplomat*, 30 August 2012.

demonstrated when a previously undetected Song-class attack submarine surfaced within sight of the USS *Kitty Hawk* during an exercise.<sup>363</sup>

The strategic/operational significance of the surge in numbers of submarines should not be exaggerated. Despite their formidable operational potential they are not the *ultima ratio* of naval warfare. Their proliferation, particularly in Asian waters, has to be balanced against the ability of various host countries to afford and to operate such a complicated platform (or a submarine fleet). Recent analysis suggests that some governments might have underestimated the difficulty of meeting a broad array of requirements that includes most obviously technical support and maintenance, but also adequate training and policies in-place for personnel retention.<sup>364</sup> Taken together, a viable submarine capability needs a support structure with significantly different types of skill sets than those needed for a surface fleet, and that generally takes many years to develop. It cannot be purchased off-the-shelf. “One can have the best technology money can buy,” one writer has noted, “but due to training or operational and/or tactical immaturity, a navy may not be able to use its technology to full effect.”<sup>365</sup> It could be, therefore, that in crowded sea lanes, these newly acquired submarines (if at sea) will more likely function as traffic hazards that larger naval Powers with more skilled submarine fleets will be at pains to avoid. It goes without saying that an adversary will always have to treat any submarine with respect and assume a high level of capability, but their effectiveness as sea denial platforms cannot be determined by mere possession.

Moreover, technology is influencing thinking about the utility of submarines as a naval warfare platform. One such development is the capability for precision strike from the sea using submarines. If significantly exploited by navies, and this has already begun in the case of the USN, the Royal Navy and the Russian Navy, it could significantly reduce the trade-offs required between sea control and power projection. Cruise missiles fired from a submerged submarine at targets ashore would reduce the potential danger to a naval asset prior to, and even after, the attack takes place. With advanced targeting information, advanced missiles might allow the submarine to offer support to forces ashore in ways that previously only naval fire could do.<sup>366</sup>

Another area of significance for submarines is in the area of propulsion. Nuclear-powered submarines (SSNs) continue to be the hallmark for endurance and they provide enormous flexibility in operational deployments. SSNs are faster submerged than diesel-electric submarines (SSKs) and can remain submerged for a much longer period of time, but they are also noisier. If SSNs are fleet submarines and able to offer some protection to surface vessels, SSKs are weapons of position—they must await their targets. New air-independent propulsion technology, however, allows modern diesel-electric submarines (SSKs) to remain submerged for weeks, thereby augmenting that platform’s stealthiness and its utility. That might not be enough. The lethality of the submarine is, in part, derived from its stealthy characteristics and detecting their presence is a core objective of many new technologies. There is already an emerging competition between

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<sup>363</sup> Matthew Hickley, “The uninvited guest: Chinese sub pops up in middle of U.S. Navy exercise leaving military red-faced”, *The Daily Telegraph*, 10 November 2007.

<sup>364</sup> Jan Joel Andersson, “The Race to the Bottom; Submarine Proliferation and International Security”, *Naval War College Review*, Vol. 68, No. 1, Winter 2015, pp. 13–30.

<sup>365</sup> I am grateful to an anonymous reviewer of this paper for these words.

<sup>366</sup> Using submarines in this way is discussed in detail in Owen R. Cote, Jr., *Precision Strike From the Sea: New Missions For a New Navy – A Report of the M.I.T. Security Studies Program’s Second Annual Levering Smith Conference*, Boston, December 1997 [accessed on 23 August 2015 at [http://web.mit.edu/ssp/publications/conf\\_series/strike/strike\\_report.html](http://web.mit.edu/ssp/publications/conf_series/strike/strike_report.html)].

detection and counter-detection. It is possible that advances in computer technology and non-acoustic detection techniques, possibly incorporated on unmanned drones, may slowly tilt the balance away from the submarine and back to those tracking it.<sup>367</sup> As a recent report by a US think tank noted, technological advances are likely to “compel a comprehensive re-evaluation [sic] of long-held assumptions about the operational and tactical employment of undersea capabilities, as well as the future design of undersea systems.”<sup>368</sup> The world of undersea warfare has become a highly dynamic environment and it will remain so for some time to come.

#### 6.4.2 Sea Mines

Sea mines are inexpensive and an extremely capable weapon. They are specifically designed to counter efforts to acquire and retain sea control. A recent report prepared for the USN states that “[m]ines are difficult to detect in the complex nearshore environment, as they are relatively small, easily concealed, and can be laid from nearly any platform. (...) Often, complex and expensive equipment is needed to efficiently and effectively hunt and neutralize mines. As a result, countering mines requires financial expenditure out of proportion to the size and cost of a typical sea mine. This imbalance is increasing as mines become more sophisticated.”<sup>369</sup>

The implicit warning in that passage concerning the lethality of sea mines is entirely justified, for they have proven their utility in many wars. During the Second World War, for example, the Allies’ campaign in the Atlantic saw British sea mines sink 638 Axis ships. (By way of contrast, British submarines and surface ships sank only 196 ships.) During the Korean War, the USN lost five vessels to sea mines (four minesweepers and one ocean going tug).<sup>370</sup> In 1968, the USN suffered its greatest loss of life in a single day during the Vietnam War when a landing ship, the USS *Westchester County*, struck two sea mines.<sup>371</sup> Two decades later, in 1991, the US-led coalition lost sea control in the northern Persian Gulf when Iraq deployed 1,300 sea mines “virtually under the ‘noses’ of multinational coalition naval forces.” In that same conflict, two US warships came close to sinking as a result of striking sea mines, and a planned amphibious assault was cancelled out of fear of further ship losses.<sup>372</sup>

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<sup>367</sup> See, for example, the discussion in Mark Prigg, “The US navy’s ‘ghost hunter’ hits the water: Robo-boats set to track down silent enemy submarines for months at a time”, *The Daily Mail*, 25 March 2015.

<sup>368</sup> Bryan Clark, *The Emerging Era in Undersea Warfare* (Center for Strategic and Budgetary Assessments: Washington, D.C., 2014), p. 16. See also the discussion of US airborne ASW assets in Geoff Fein and Grace Jean, “Changing the game: USN sets new approach to sub threats”, *Jane’s Navy International*, January/February 2015, pp. 16–23.

<sup>369</sup> Ocean Studies Board, National Research Council, *Oceanography and Mine Warfare* (National Academy Press: Washington, D.C., 2000), p. 18.

<sup>370</sup> USN ships lost during the Korean War after striking mines were four minesweepers (USS *Magpie*, USS *Pirate*, USS *Pledge*, and USS *Partridge*) and one ocean going tug (USS *Sarsi*). Sam LaGrone, “Notable U.S. Navy Ships Lost Since World War II”, *US Naval Institute Blog*, 5 February 2013 [accessed on 27 February 2015 at <http://news.usni.org/2012/08/28/notable-us-navy-ships-lost-world-war-ii>]. See also Joseph H. Alexander, “Fleet Operations in a Mobile War”, in Edward J. Marolda (ed.), *The United States Navy in the Korean War* (Naval Institute Press: Annapolis, Maryland, 2007).

<sup>371</sup> John Beery, “Largest Loss of Life by U.S. Navy During Vietnam War”, *Veterans Today* (online), 1 November 2008.

<sup>372</sup> Scott C. Truver, “Taking Sea Mines Seriously; Mine Warfare in China’s Near Seas”, *US Naval War College Review*, Vol. 65, No. 2, Spring 2012, pp. 31–32.

Given this history, the danger posed by sea mines to modern naval operations should never be under-estimated, and it is noteworthy that, in the US *Naval Operations Concept* (2010), sea mines are described as “the greatest area-denial challenge in the maritime domain.”<sup>373</sup> They are sometimes referred to as “the poor man’s naval force” and their proliferation is possibly as dangerous, if much less visible, than that of ballistic missile technologies.<sup>374</sup> Today, the enormous stockpiles of sea mines that countries such as China and Iran have accumulated underscore a belief in their continuing operational (and, quite possibly, strategic) relevance.<sup>375</sup> Sea mine technology has advanced in the past four decades with the result that some now possess “accurate control and guidance and initiative attack capacity.” One type of rising torpedo mine, the Russian-made PMK-2, is said to be capable of being laid in waters as deep as 2,000 metres. China, with an arsenal of 50,000 to 100,000 sea mines, has “over 30 varieties of contact, magnetic, acoustic, water pressure and mixed reaction sea mines, remote control sea mines, rocket-rising and mobile mines...”<sup>376</sup> There have also been reports of theoretical discussions in China and North Korea about arming sea mines with tactical nuclear weapons.<sup>377</sup>

The effectiveness of sea mines lies in the fact that they need not be very sophisticated or expensive.<sup>378</sup> They are difficult to eliminate. Alongside the threat they pose to the conduct of naval operations, even a rumour that they have been deployed in a sea lane or near a port will disrupt international shipping and divert resources from mine clearing requirements elsewhere.<sup>379</sup> In the Second World War, a German submarine laid mines in the entrance to the port of Charleston, South Caroline, closing it for 16 days.<sup>380</sup> Washington’s decision in May 1972 to mine Haiphong harbour interdicted 95 percent of North Vietnam’s seaborne logistics supply during the following two years without any loss of US life.<sup>381</sup> Today, of course, a few mines in the approaches to a major port could severely damage a country’s or an entire region’s economy, and if deployed near the waters of a major naval facility might hamper the conduct of naval operations all over the globe.

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<sup>373</sup> US Department of the Navy, *Naval Operations Concept* (Washington, D.C., 2010), p. 56.

<sup>374</sup> Committee for Mine Warfare Assessment, *Naval Mine Warfare*, p. 52.

<sup>375</sup> Mark Gunziger, *Outside-In: Operating from Range to Defeat Iran’s Anti-Access and Area-Denial Threats*, (Center for Strategic and Budgetary Analysis: Washington, D.C., 2011), p. 41.

<sup>376</sup> Daniel Goure, *Countering the Asymmetric Threat from Sea Mines* (The Lexington Institute: Washington, D.C., 2010), p. 4.

<sup>377</sup> A Chinese naval analyst is reported to have observed that it was possible to sink an adversary’s nuclear submarine from a distance of 2,000 metres with nuclear-armed sea mines. Andrew Erikson, Lyle Goldstein and William Murray, “China’s Undersea Sentries”, *Undersea Warfare* (online), Vol. 9, No. 2, Winter 2007. See also “Report: North Korea Developing Nuclear Sea Mines”, *Information Dissemination* (online), 9 December 2010 [accessed on 21 March 2015 at [www.informationdissemination.net/2010/12/report-north-korea-developing-nuclear.html](http://www.informationdissemination.net/2010/12/report-north-korea-developing-nuclear.html)].

<sup>378</sup> Tangredi, *Anti-Access Warfare: Countering A2/AD Strategies*, p. 172–174. In April 1988, an Iranian moored mine of First World War vintage nearly sank the guided missile frigate, the USS Samuel B. Roberts. See Anthony H. Cordesman, *The Gulf Military Balance, Volume I; The Conventional and Asymmetric Dimensions* (Center for Strategic and International Studies: Washington, D. C., 14 January 2014), p. 206.

<sup>379</sup> Norman Youngblood, *The Development of Mine Warfare: A Most Murderous and Barbarous Conduct* (Praeger Security: Westport Connecticut, 2006), pp. 168–170.

<sup>380</sup> Truver, “Mines and Underwater IEDs in U.S. Ports and Waterways”, p. 108.

<sup>381</sup> Committee for Mine Warfare Assessment, Naval Studies Board, *Naval Mine Warfare; Operational and Technical Challenges for Naval Forces* (National Academy Press: Washington, D.C., 2001), p. 18.

Whether they are conventional or nuclear, the challenge sea mines will pose to in-theatre mine clearing is enormous. At the beginning of the Korean War, 3,000 Soviet and Chinese mines forced a 250-ship amphibious task force to remain off the coast of the peninsula for a week.<sup>382</sup> Nearly seven decades later, during a major international exercise in September 2012 “in and around the Persian Gulf and Arabian Sea” involving 30 countries and led by the USN, less than one-half of the practice mines were located.<sup>383</sup> In the modern maritime operating environment, where sophisticated sea mines can co-exist alongside maritime equivalent of underwater improvised explosive devices (UWIEDs), such results are not reassuring. The exercise’s outcome might be due, in part, to the low priority that naval mine warfare (employment and counter-measures) has received from Western navies in recent decades. A recent study by a Washington-based think-tank directly addressed this and asserted that countering the threat will require both “the quantitative expansion and qualitative improvement of U.S. mine countermeasures capabilities.”<sup>384</sup> This would include a greater number of ships specifically equipped for mine counter measures (MCM), dedicated MCM helicopters, as well as a greater investment in remotely operated platforms.<sup>385</sup> Concomitantly, one can assume that signature reduction technologies will become ever more important in reducing the likelihood of mine activation, an issue that is particularly important in the littoral battlespace.<sup>386</sup>

## 6.5 Littoral Operations

Many governments expect that, as ocean politics intensify in the 21<sup>st</sup> century, future military operations will be focussed in the littoral areas. Such missions will demand increased attention to joint action in planning and execution. Purpose-designed platforms for amphibious operations that will be capable of conducting a number of tasks simultaneously (e.g., strategic transport, C4ISR<sup>387</sup>, amphibious landing and sea-basing) will also be required to ensure rapid deployability.<sup>388</sup> Nevertheless, and despite a smaller area of operations than war on the high seas, the difficulties of projecting power *from the sea* should not be underestimated.<sup>389</sup> Certain types of vessels cannot easily operate in littoral waters and, in most cases, the shore will not be a passive environment. Indeed, the threat approaching naval vessels will face could be both intense and dense (i.e., a wide array of options will be available to a defending force). It is for this reason that some navies, such as the USN, have adapted submarines for this purpose. Guided-missile submarines (SSGNs) are able to launch cruise-missiles or land special forces close to enemy shores as a means of projecting power from the sea—and reliance on an adaptation of an

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<sup>382</sup> Truver, “Mines and Underwater IEDs in U.S. Ports and Waterways”, p. 109.

<sup>383</sup> Daniel Sagalyn, “U.S. Navy, Allies Find Less Than Half the Sea Mines Planted in Key Exercise”, *PBS NewsHour* (online), 15 October 2012 [accessed on 21 March 2015 at [www.pbs.org/newshour/rundown/us-navy-allies-find-less-than-half-the-sea-mines-planted-in-key-exercise/](http://www.pbs.org/newshour/rundown/us-navy-allies-find-less-than-half-the-sea-mines-planted-in-key-exercise/)].

<sup>384</sup> Goure, *Countering the Asymmetric Threat from Sea Mines*, p. 1.

<sup>385</sup> This argument is made in Commander Thomas S. Reynolds (USN), “Learning from IEDs”, *Proceedings* (US Naval Institute), August 2013, pp. 55–59.

<sup>386</sup> Committee for Mine Warfare Assessment, *Naval Mine Warfare*, pp. 91–93.

<sup>387</sup> C4ISR – command, control, communications, computers, intelligence, surveillance and reconnaissance.

<sup>388</sup> Stefan Nitschke, “Power Projection”, *Naval Forces*, V/2011, p. 26.

<sup>389</sup> “[T]hese regions are where the effects of massive change along every human axis – social, demographic, cultural, technological and climatological – are increasingly being concentrated.” Vice Admiral Dean McFadden, “The Navy and Canada’s National Interests in this Maritime Century”, *Canadian Naval Review*, Vol. 6, No. 1, Spring 2010, p. 6.

otherwise submerged platform is likely to continue.<sup>390</sup> Improved surface fleet lethality by developing longer-range weapons and sensors, and combining platforms in novel ways, is another response to the challenges associated with littoral warfare.<sup>391</sup> Such approaches to naval operations underscore the reality that the proliferation of affordable sophisticated military technology has levelled the zone of battle, and has significantly reduced the element of surprise as well as the strategic mobility that naval forces traditionally enjoyed.<sup>392</sup> “Probably by 2030,” a leading US naval thinker has argued, “we would have to accept that ships are visible, identifiable and trackable within a few hundred or a few thousand miles off-shore of anyone willing to make the effort to do so.”<sup>393</sup>

As a conflict zone, the littorals will be characterised by opacity. It has always been very challenging to find hostile forces on the high seas, but will be even more difficult to “see” (i.e., identify) hostile forces in the littoral battlespace, because “radars, sonars and optical sensors are presented with environmental, topographic and hydrographic variations that are more marked inshore than they are at sea.”<sup>394</sup> Significantly, that problem will not affect land-based systems that will be able to track and target slow-moving naval vessels. Naval commanders and planners will, therefore, confront a complex, dynamic, cluttered and extremely dangerous environment in which friendly, adversarial and neutral forces coexist.<sup>395</sup> The “bystander problem”—“civilian tankers, freighters, fishing boats and aircraft going about their daily business”—will constantly obscure a friendly vs. hostile picture of the situation. And, unlike blue water operations, where the conflict is largely fleet-on-fleet or platform on platform, fighting in the littorals will probably be multifaceted. It could include “irregular, hybrid and state-centric threats [that] will need to be confronted both at sea and ashore in a human landscape where the consequences of massive change and disruption in all its social, climatological and technological dimensions will play out in the coming decades.”<sup>396</sup>

Littoral operations will also involve conflict at much closer ranges than in the open ocean, significantly reducing the time for command (i.e., detect, identify, track and engage) decisions, and decreasing the tactical freedom upon which the success of naval operations depend.<sup>397</sup> Because threats can come at any time from any direction in the littorals, ships operating in that environment will need to maintain “a constant, all-dimensional state of alert” that will lead to “a degradation of crews, equipment and readiness that makes the ship particularly vulnerable.”<sup>398</sup> As no Great Power has engaged in a war with a peer competitor in a littoral setting since 1945, much of the technology and weapons that exist today are untested in combat—and the thinking and planning of strategies for battle are largely conceptual. It is nonetheless acknowledged by naval

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<sup>390</sup> James Holmes, “Hail to the Deep: A Strategy for Submarines”, *The National Interest* (online), 25 June 2014.

<sup>391</sup> Grace Jean, “USN set to bolster surface fleet lethality”, *Jane’s Defence Weekly*, 21 January 2015, p. 11.

<sup>392</sup> Rear Admiral Yedidia ‘Didi’ Ya’ari, Israeli Navy, “The Littoral Arena: A Word of Caution”, *US Naval War College Review*, Vol. 67, No. 3, Summer 2014, p. 83.

<sup>393</sup> Norman Friedman, “The U.S. Navy of 2030”, *Defense Media Network*, 21 June 2012 [accessed on 6 January 2015 at [www.defensemedianetwork.com/stories/the-u-s-navy-of-2030/](http://www.defensemedianetwork.com/stories/the-u-s-navy-of-2030/)].

<sup>394</sup> Norman Friedman makes the observation about the difficulty of finding an adversary at sea in “Naval Strategy”, Andrew T. H. Tan (ed.), *The Politics of Maritime Power: A Survey* (Routledge: London, 2001), p. 29. The quotation is taken from *Horizon 2050: A Strategic Maritime Concept for the Canadian Forces*, p. 27.

<sup>395</sup> Vego, *Operational Warfare at Sea; Theory and Practice*, p. 221.

<sup>396</sup> *Horizon 2050: A Strategic Maritime Concept for the Canadian Forces*, p. 25.

<sup>397</sup> *Horizon 2050: A Strategic Maritime Concept for the Canadian Forces*, p. 27

<sup>398</sup> Ya’ari, “The Littoral Arena: A Word of Caution”, p. 83.

theorists that confronting a modern, well-equipped adversary in a littoral environment will be far more dangerous than anything seen since the most intense naval engagements of the Second World War. Being able to protect maritime forces in the littorals from conventional and asymmetric attack and to insert, to protect and to recover forces ashore will in the future be key to achieving strategic and operational objectives. Weapons systems to deal with threats to the accomplishment of such aims, such as anti-ship ballistic missile defence and sea-based ballistic missile defence, will become increasingly important. Indeed, ship-based ballistic missile defence to protect naval vessels as well as forces ashore (i.e., theatre ballistic missile defence) will grow in importance should weapons of mass destruction proliferate and are incorporated in war-fighting doctrines.<sup>399</sup> “The constraints in [this] ‘ballpark’ are quite different from the ones that shaped the development of most current naval force structures,” an Israeli admiral has warned.<sup>400</sup>

## 6.6 The Impact of Technology

While every naval engagement is unique, it is axiomatic that technology and technological advantage are important in influencing (to a greater or lesser degree) the outcome. The presence of three heavily armed galleasses at Lepanto (1571) directly contributed to the Venetian-Spanish victory as there was nothing comparable in the equally-sized Ottoman fleet.<sup>401</sup> The loss of HMS *Prince of Wales* and *Repulse* at the Battle of Malaya (1941) demonstrated the qualitative edge that Japanese bombers had over otherwise formidable warships.<sup>402</sup> In some cases, the technological advantage can be very slim and yet still prove decisive. Before the Falklands campaign (1982), the Royal Navy had endured budget cuts, creating vulnerabilities that were to be tragically revealed in battle. However, its possession of advanced US missiles tipped the air-to-air battles in Britain’s favour and directly contributed to eventual victory.<sup>403</sup>

Since the end of the Cold War, Western navies have become accustomed to operational environments where they have deployed forces that have been markedly superior in technology. Most often, commentators point to the development of advanced weaponry, such as precision-guided munitions. Other, more commonplace technologies applied by armed forces have also marked Western naval superiority. One of the most significant is that of global positioning systems and other targeting aids. Using these, ships can fire missiles ashore at ranges in excess of 1,000 miles, and from the safety of international waters.<sup>404</sup> As a consequence, the dangers associated with having to closely engage an adversary have not been a major consideration for some years now. In the future, however, naval planners will be increasingly confronted by widespread proliferation of advanced and affordable technologies that will alter assumptions of armed engagements at sea.

The spread of technology, and often of advanced weapons (e.g., ballistic missiles and sea mines), will continue to increase the risks to platforms of the traditionally more advanced navies at sea. This will reduce the margins for operational and strategic error. The unexpected and disabling July 2006 attack by Hezbollah on the Israeli Navy missile ship (the INS *Hanit*) using an Iranian-supplied,

<sup>399</sup> Till, *Seapower – A Guide to the Twenty-First Century*, p. 33.

<sup>400</sup> Ya’ari, “The Littoral Arena: A Word of Caution”, p. 81.

<sup>401</sup> John Guilmartin, *Gunpowder and Galleys: Changing Technology and Mediterranean Warfare at Sea in the 16<sup>th</sup> Century* (Conway Maritime Press: London, 2003), p. 245–247.

<sup>402</sup> See Till, *Understanding Victory*, pp. 113–117.

<sup>403</sup> See Till, *Understanding Victory*, pp. 153–155.

<sup>404</sup> I am grateful to Cdr. Steve Thompson (RCN) for this argument.

Chinese-designed C-802 guided missile fired from the back of a pick-up truck is a good example of the damage that can be inflicted on ships at sea by increasingly available advanced weaponry. Despite its extensive intelligence on Hezbollah, the *Hanit*'s commander did not believe that such a threat existed and the ship's advanced sensors and defence systems were not activated in part to avoid interfering with an ongoing air operation. That incident is a harbinger of the future. Unless strategy takes account of the increased likelihood of losses, naval power could be expended with little to show for it. Unless operational doctrine takes account of the increased risk to naval vessels, those losses are almost certain.<sup>405</sup>

The danger to maritime Powers is that a technological edge could afford a putative adversary (even one much weaker in a number of other categories of capability) a decisive advantage in any armed confrontation. It is arguable, however, that such an advantage might not come from a ground-breaking new technology. As has often happened in earlier eras of naval warfare (e.g., the Battle of the Atlantic), it might come about through the integration of "several known rather mundane inventions."<sup>406</sup> In such a case, several technological innovations might be combined to produce rapid change. Obvious examples of this include the development of the modern battleship and the submarine in the early-twentieth century and the role of naval aviation forty years later.<sup>407</sup> In our own time, a similar dynamic is already evident in the continuing development of anti-ship ballistic missiles, in the linkage of computer networking and sensors in fire control systems (e.g., the US-designed Cooperative Engagement Capability or CEC) for fleets, in the use of advances in commercially-accessible undersea technology and unmanned systems, and in the development of advanced bi- and multi-static underwater acoustics.<sup>408</sup> Based on the historical record, it is reasonable to assume that the impact of technology in the future is likely to be evolutionary as opposed to revolutionary.

Recent advances do, nonetheless, highlight the possible impact of entirely novel technologies. Much like the advent of nuclear weapons, they have the potential to transform how the present generation of strategists approach the use of naval power. The emergence of 3D printers (a prototype was recently installed on the USS *Essex*) and remotely operated vehicles could positively transform naval logistics, thereby enhancing the sustainability of deployed ships.<sup>409</sup>

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<sup>405</sup> In the case of the Israeli Navy, the reaction to the near loss of the *Hanit*, one its best equipped ships, was swift. "There were no more risks taken, all systems were continuously activated" is how one writer has described it.<sup>405</sup> Doctrine was also changed – Israeli Navy patrols off Lebanon's shores are now preceded by air strikes to eliminate coastal radar installations. See Klaus Mommsen, *60 Years Israeli Navy* (Bernard and Graefe: Bonn, 2011), pp. 310–311.

<sup>406</sup> Kurt Lautenschlager, "Technology and the Evolution of Naval Warfare" in Steven E. Miller and Stephen Van Evera (eds.), *Naval Strategy and National Security* (Princeton University Press, 1988), p. 174.

<sup>407</sup> Arthur J. Marder, *From the Dreadnought to Scapa Flow: Volume 1, The Road to War 1904-1914* (Naval Institute Press, Annapolis Maryland, 2013), pp. 43–45.

<sup>408</sup> See "The Cooperative Engagement Capability", *Johns Hopkins APL Technical Digest*, Vol. 16, No. 34, 1995, [accessed on 12 November 2014 at <http://techdigest.jhuapl.edu/td/td1604/APLteam.pdf>], pp. 377–396, and Dr. Rand D. LeBouvier, "ASW and Unmanned Undersea Systems; An Ideal Application of a Patient and Prolific Technology", *Sea Technology*, November 2014, pp. 13–17. Discussion of the future military utility of autonomous systems can be found in Office of Naval Research, *Final report – Autonomous Systems innovation Summit*, 17–18 November 2008.

<sup>409</sup> "Navy Explores the Future of 3D Printing", *Currents* (online), Fall 2014, pp. 42–46 [accessed on 20 March 2015 at <http://greenfleet.dodlive.mil/currents-magazine/files/2014/10/Fall14-Navy-3D-Printing.pdf>] and Joey Cheng, "Navy looks to cash in on 3D printing at sea", *Defense Systems* (online), 30 June 2014 [accessed on 12 March 2014 at <http://defensesystems.com/articles/2014/06/30/navy-3D-printing-faire.aspx>].

The development of cyber capabilities holds out the possibility of impacting (positively or negatively) the conduct of naval operations. While they cannot inflict violence on their own, they have greatly increased the battle-space awareness and responsiveness of ship and fleet commanders. At the same time, however, adversarial deployment of cyber capabilities could just as easily disrupt the effectiveness of naval platforms or networked fleets.<sup>410</sup> In late-2008, the USN was hit by a computer virus, as was the Royal Navy the following year.<sup>411</sup> If such an attack were to impact the combat system of a ship or a fleet (as a result of computer networking) in wartime the operational and strategic impact would be considerable, possibly even decisive.

Perhaps no area of technological advance has had more immediate impact in recent years than the development and deployment of autonomous vehicles. A recent report prepared by the Naval Studies Board noted that,

new capabilities will be required of naval forces in the areas of maritime intelligence, surveillance and reconnaissance (ISR); oceanographic bathymetric surveys; battlespace preparation; battlespace awareness; mine warfare; antisubmarine warfare (ASW); special operations and strike support; surface warfare (including interdiction); littoral ASW with emphasis on diesel submarines; and base and port security.<sup>412</sup>

These kinds of missions greatly benefit from an integrated ISR and real-time knowledge creating a demand that, for even the largest navy, can be partially alleviated by using unmanned aerial vehicles (UAVs), unmanned surface vessels (USVs) and unmanned underwater vehicles (UUVs). UAVs are already helping to meet many countries' maritime security requirements. Operational deployments have already testified to the versatility and value of UAVs, with USN operations in support of ground forces in Kosovo, Afghanistan and Iraq, using shipborne UAVs. Smaller navies have also placed a new emphasis on this capability. With an enormous ocean estate to patrol, the Indian Navy currently operates two squadrons of UAVs and, in early-2015, announced plans to acquire a further 50 such drones.<sup>413</sup> UUVs are becoming increasingly important in naval planning, and the USN, the PLA(N) and the Russian Navy have invested considerable resources in developing this capability.<sup>414</sup> USVs have been around since at least the Second World War when they were used for mine-clearing, a role that they are re-acquiring. UUVs are less expensive to acquire and maintain than submarines, but they are demonstrating the capacity to undertake missions that might seriously endanger the larger platform. Much of what these systems are capable of is classified, but we already know from open sources that UUVs are being developed by the USN to support special forces operations.<sup>415</sup> It is reasonable to assume that future advances in technology

<sup>410</sup> See Lucas Kello, "The Meaning of the Cyber Revolution: Perils to Theory and Statecraft", *International Security* Fall 2013, pp. 7–40. In the same issue, Erik Gatzke takes issue with the strategic impact of cyber capabilities, arguing that they are not likely to be pivotal in wartime. See "The Myth of Cyberwar: Bringing War in Cyberspace Back Down to Earth", *International Security*, Fall 2013, pp. 41–72.

<sup>411</sup> Henrotin, *Les Fondements de la Stratégie Navale au XXIe Siècle*, p. 326.

<sup>412</sup> Naval Studies Board, *Autonomous Vehicles in Support of Naval Operations* (National Academies Press: Washington, D.C., 2005), p. 116.

<sup>413</sup> "Indian Navy Plans to Acquire 50 Drones for Intel, Surveillance Purposes to Boost Maritime Security", *Daily News and Analysis Online* (Mumbai), 3 March 2015.

<sup>414</sup> United States Congress, Committee on Armed Services, "Game Changers – Undersea Warfare", *Hearing before the Subcommittee on Seapower and Projection Forces*, Washington, D.C., 27 October 2015, p. 15.

<sup>415</sup> Committee on Armed Services, "Game Changers – Undersea Warfare", *Hearing before the Subcommittee on Seapower and Projection Forces*, p. 18.

and design will expand the range of missions that remotely operated vehicles can undertake in support of naval operations.<sup>416</sup> Indeed, because of their size and their construction (often plastics) their proliferation has already triggered a need for counter-UUV technologies.

Weapons technology is also changing. Advances have led some naval analysts to view ship-borne lasers as a “game changer”, similar to the advent of guided missiles in the 1950s.<sup>417</sup> Directed energy weapons such as lasers could allow naval vessels to more effectively counter asymmetric threats such as unmanned and light aircraft, as well as repel swarming attacks by small boats.<sup>418</sup> Some analysts also believe that directed-energy weapons could successfully deal with the challenge posed by growing anti-access (i.e., sea denial) capabilities of US adversaries.<sup>419</sup> Indeed, the 2015 US Navy maritime strategy identifies the development of “directed energy and electromagnetic railguns” as a priority.<sup>420</sup> Although questions remain about the laser’s general utility—its performance can be affected by particulate matter in the atmosphere, including sand—in late-2014, Washington announced that a deployed laser weapons system was an operational asset on a naval vessel deployed in the Persian Gulf.<sup>421</sup> Reports that the USN is contemplating the upgrade of the armament of many of its destroyers with such weapons systems indicate that both the combat potential and cost effectiveness of these very new technologies are highly regarded.<sup>422</sup> More significant still, if borne out by use that judgement will not long be unique to USN commanders.

Regardless of whether it is evolutionary or revolutionary in origin, the development of new technologies is only one side of the challenge that navies will face. Modern navies have become increasingly dependent on technology with the result that new vulnerabilities have been created. The ability (or not) to prevent disruption of much-heralded advances, such as the global positioning system (GPS) technology, adds to uncertainty and operational friction.<sup>423</sup> The rates at which technology can be incorporated into modern naval systems and, just as important, thinking about naval force development can be adapted, are also inherently unpredictable. Many smaller- and

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<sup>416</sup> Nearly a decade ago, two Russian analysts reported “a groundswell of interest” in their country in what they called military underwater robots, a level of interest that is unlikely to have abated. See M. R. Gizitidinova and S.M. Cherkasov, “Mobile Underwater Robots: Their Part in Navy Mission”, *Military Thought* (Moscow), Vol. 17, No. 1, 2008, p. 99.

<sup>417</sup> Richard O’Rourke, *Navy Shipboard Lasers for Surface, Air, and Missile Defense: Background and Issues for Congress* (Congressional Research Service: Washington, D.C., 31 July 2014), p. 3.

<sup>418</sup> “Electromagnetic Railgun and Other Innovations Continue Dahlgren’s Tradition”, *Currents – The Navy’s Energy and Environmental Magazine*, Fall 2014, pp. 16–17.

<sup>419</sup> According to a report prepared by the Center for Strategic and Budgetary Analysis, “[f]itting Arleigh Burke-class DDGs and other surface ships with SSLs [solid state lasers] could provide the Navy with a globally deployable network for countering attacks by surface craft, UAVs, and possible ASCMs...”. The report notes that a high-power DE [directed energy] capability could be “the harbinger of a discontinuous shift in the military competition between guided munitions and the systems designed to defend against them.” Mark Gunziger, *Changing the Game; The Promise of Directed-Energy Weapons* (Center for Strategic and Budgetary Assessments: Washington, D.C., 2012), pp. 26–26.

<sup>420</sup> *A Cooperative Strategy for 21<sup>st</sup> Century Seapower* (Washington, D.C., March 2015), p. 35.

<sup>421</sup> Dave Sloggett, “Does the USN ‘Star Wars’ Laser Cut it?”, *Warship International*, February 2015, pp. 12–13.

<sup>422</sup> Sam Lagrone, “U.S. Navy Allowed to Use Persian Gulf Laser for Defense”, *USNI News*, 10 December 2014, Kerri Osborne, “Navy Mulls Lasers, Rail Guns for Existing Destroyers”, *Defense Tech*, 31 December 2014 [accessed on 2 January 2014 at [defensetech.org/2014/12/31/navy-mulls-lasers-rail-guns-for-existing-destroyers](http://defensetech.org/2014/12/31/navy-mulls-lasers-rail-guns-for-existing-destroyers)], and Rod McGuirk, “US Admiral Praises Laser and Electromagnetic Guns on Costs”, *Associated Press*, 10 February 2015.

<sup>423</sup> I am grateful to Cdr. Stan Bates (RCN ret’d) who drew my attention to this argument.

middle-Power navies will be unable to afford the large research and development expenses associated with new weapons technologies, and they will probably wait to assess their operational effectiveness by larger naval Powers.<sup>424</sup> But even for the largest navies, incorporation of new technologies will be a function of technical insight, accessible expertise and institutional adaptability, none of which is guaranteed to be present and all of which will nonetheless confront the bureaucratic sluggishness for which all military institutions are notorious.<sup>425</sup> Even if a technological innovation is recognized as valuable, navies will still need to adapt tactics to ensure its most effective use; and that too could take considerable time and effort, with eventual success far from certain. The ultimate test always will always be survivability in combat. Failure to innovate could lead to inefficiencies in war-fighting and possible capability gaps, sometimes with dire consequences. Nevertheless, the absence of any guarantee that the potential of existing or new technologies will be understood and incorporated means that there will always be an element of unpredictability concerning the relationship navies have with technological change.

## 6.7 The Importance of Interoperability

Interoperability at sea with allies and trusted international partners will be of increasing importance as a key enabler for operational and strategic success in maritime warfare of the future. The high-intensity, multi-threat environment that characterises contemporary naval operations will also demand a range of capabilities beyond what most modern navies possess or can afford to acquire. In 2012, the commander of the RCN, Vice-Admiral Paul Maddison, wrote that “[m]aritime warfare will require fully integrated offensive and defensive joint action across all physical dimensions in the maritime domain—from the seabed to space—as well as full use of the electromagnetic and informational environments.” “[S]uch operations,” he added, “will require far more than the bringing together of a coalition at the time of crises. They will require ever-higher degrees of interoperability to effect a merging of allied and coalition maritime forces at the technical, tactical and doctrinal levels...”<sup>426</sup>

However, what theorists assert is required will likely not be achieved—at least not in terms of technological interoperability. The goal of a networked coalition fleet will almost certainly become more difficult to reach within the Western Alliance as the gap between the technology deployed on US and non-US naval platforms expands. The cost of keeping pace with the USN will be the principal reason. Leading naval Powers are already being forced to scale back earlier expectations. For example, as a cost saving measure, the UK announced in June 2012 that it would not be acquiring CEC for its newest warships.<sup>427</sup> While the decision was made for budgetary reasons, it will likely have a strategic impact on UK foreign and defence policy, undercutting the ability of Royal Navy ships to operate alongside the US Navy in high intensity operations.<sup>428</sup> Other navies are facing a similar dilemma—whether to devote funds from already

<sup>424</sup> I am grateful to Daniel Salisbury for this observation.

<sup>425</sup> See, for example, Peter Marland, “Post-war Fire Control in the Royal Navy”, John Jordan (ed.), *Warship 2014* (Conway: London: 2014), pp. 146–162.

<sup>426</sup> Vice Admiral Paul Maddison, “Strategic Trust and Cooperation”, *Naval War College Review*, Vol. 65, No. 4, Autumn 2012, p. 11.

<sup>427</sup> Thomas Harding, “Cutting Missile system leaves warships at risk”, *The Daily Telegraph*, 9 June 2012.

<sup>428</sup> “Lack of CEC Sensor Shooter Capability is a Major Error”, *Warship – International Fleet Review* (online), 27 June 2012 [accessed on 4 September 2014 at [www.warshipsifr.com/index.php?option=com\\_content&view=article&id=94:lack-of-cec-sensor-shooter-capability-is-a-major-error&catid=36:commentary&Itemid=65](http://www.warshipsifr.com/index.php?option=com_content&view=article&id=94:lack-of-cec-sensor-shooter-capability-is-a-major-error&catid=36:commentary&Itemid=65)].

reduced budgets to maintain a necessary level of interoperability with the US Navy or to build more, but somewhat less capable warships.<sup>429</sup> Unfortunately for those in charge of naval force development, the answer to this dilemma regarding future requirements is not obvious.

One solution to the difficulties of interoperability among unequal naval forces will be to increasingly view the issue as more than just a function of technology. Not all missions require the same level of interoperability, and the building of a coalition force around that recognition would still permit effective burden-sharing in some cases. This would require the development of a common understanding between the US and its possible coalition partners about what each country wants to contribute to a specific type of operation, and that assessment would in part inform naval force development, most likely including acquisitions and development projects. Each potential ally would, therefore, predetermine what role it would seek to play in a US-led force.<sup>430</sup> The benefit of such an approach is obvious: the US, as the leading Western naval Power, might then be able to count upon support from a broad array of countries in lower risk missions where the pre-determined level of interoperability would be an operational asset. A potential drawback is that the US could conceivably end up going it alone in high-intensity operations because the risk of involving less-technologically interoperable allies would be too great. Such a division of tasks will have inevitable negative implications for managing coalitions and, in the case of the Western Alliance, will do little to advance the longstanding objective of encouraging countries to dedicate additional resources to collective defence. In any event, the added legitimacy that a US-led operation would obtain through the participation of coalition partners might not offset the resentment in Washington that it alone is expected to bear the burden of the most intense challenges. It is more likely, however, that many if not most countries would not willingly structure their navies by preselecting operations to which they would contribute. Doing so would risk a loss of sovereign decision-making power and freedom of action, as it might create an expectation in Washington and other allied capitals that participation in a US-led coalition would be automatic. These drawbacks suggest that interoperability at some level will remain an important naval force development objective. At the same time, it will continue to be challenging for navies in the coming decades as it becomes increasingly necessary to ensure effectiveness with smaller contributions to maritime coalition operations.

## 6.8 Thinking about Attrition

Attrition is not a characteristic of the maritime operating environment—but it will be a consideration of naval planning and operations as the 21<sup>st</sup> century unfolds. In the “virtual wars” of the 1990s in which Western Powers were engaged, or the more traditional conflicts in the decade that followed, no ships have been lost in combat. In some quarters, this has created an expectation that navies no longer lose ships in conflict situations. Such an assumption is not only unwarranted, but potentially dangerous. It is important to note that the record of the past two decades was obtained in what most would agree were permissive environments at sea. By way of contrast, during the Falklands War (1982), the last conflict at sea that did not occur in a permissive environment, the Royal Navy lost several warships. An article written shortly after

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<sup>429</sup> This argument is made in Ben Lombardi and David Rudd, “Naval Force Structure in a Time of Fiscal Austerity: Downsizing, Innovation and Change”, DRDC CORA Letter Report (LR 2011-179), 2 November 2011.

<sup>430</sup> Kenneth Gause, Catherine Lea, Daniel Whiteneck and Eric Thompson, *US Navy Interoperability with its High-End Allies* (Center for Naval Analysis, Alexandria, Virginia, n.d.), p. 7.

those hostilities ended asserted that “[t]he Falklands conflict showed that all surface ships are vulnerable”, and to cushion the possibility of losses navies needed more ships.<sup>431</sup> That admonition is still valid decades later. In the intervening years, some naval vessels have been very seriously damaged<sup>432</sup>; and in the August 2008 engagement between the Russian and Georgian navies off the coast of Abkhazia, one of the four Georgian ships (a missile patrol boat) was sunk and another badly damaged.<sup>433</sup> The risk of such occurrences happening in the future—i.e., ships put out of action or sunk—can only increase as the conflict setting becomes more intense, particularly if it is centred on the littorals with adversaries that possess modern capabilities.<sup>434</sup> “History has shown us,” a recent commentator has written, “that in the complicated littoral sea-control environment, losses are not only possible, they are inevitable.”<sup>435</sup>

A warship can only be in one place at a time and a smaller fleet means fewer places to which a navy can simultaneously deploy its ships. A smaller fleet not only implies reduced capabilities—quantity being an ineluctable measure of capability—it diminishes the strategic agility of a navy as well as reduces its resilience, herein defined as the ability to absorb losses and still achieve operational objectives. It is, therefore, incontrovertible that fleet size is linked to a navy’s utility as an instrument of national policy. For even the largest navy, such as the USN, the consequences of reductions could be significant. The most recent US maritime strategy acknowledges this in its admonition that “[a] smaller force,” would be required to execute whatever tasks it was assigned “at increased levels of risk for some missions and functions, decrease forward presence, and reduce our footprint in some geographic regions.” “Such cuts,” it continues, “would also reduce our warfighting advantage.”<sup>436</sup> Perhaps more so for smaller navies, the consequences of fleet downsizing are daunting. It is conceivable that a government confronting such circumstances might be reluctant to deploy a warship on a mission where it might be disabled or lost when a single vessel represents a large proportion of the country’s naval strength.<sup>437</sup> And, even if there is a decision to deploy, a smaller fleet’s ability to accomplish whatever operational objectives it is given

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<sup>431</sup> Bruce George, MP and Michael Coughlin, “British Defence Policy after the Falklands”, *Survival*, September/October 1982, p. 203.

<sup>432</sup> For example, in May 1987 the USS *Stark* was struck while operating in the Persian Gulf by an anti-ship missile fired by an Iraqi Air Force aircraft: in April 1988, the USS *Samuel B. Roberts* struck a mine in the Persian Gulf and nearly sank: in February 1991, the USS *Princeton* struck a mine in the Persian Gulf and was in repair for months and that same day the USS *Tripoli* was nearly lost after also striking a mine: the USS *Cole* was badly damaged by al Qaeda suicide bombers in October 2000 by the explosion of a small boat in Aden Harbour: in July 2006, an anti-ship missile, fired from a truck by Hezbollah, severely damaging the INS *Hanit*, an Israeli corvette off the coast of Lebanon: in March 2010, the ROKS *Cheonan* was sunk in the Yellow Sea by a torpedo fired by what many analysts assume was a North Korean midget submarine.

<sup>433</sup> “Reports: Russia sinks Georgian ship trying to attack Russian naval ships”, *The Jerusalem Post*, 10 August 2008 The surviving Georgian vessels were subsequently destroyed in harbour. See Dmitry Gorenburg, “The Russian Black Sea Fleet After the Georgian War”, *Ponars Eurasia Policy Memo*, No. 48, December 2008, pp. 2–3.

<sup>434</sup> This argument is made in Montgomery, “Contested Primacy in the Western Pacific: China’s Rise and the Future of U.S. Power Projection”, p. 117.

<sup>435</sup> Captain Victor Addison, Jr. (USN), “Got Sea Control?”, *US Naval Institute Proceedings*, Vol. 136, No. 3, March 2010 [accessed on 12 November 2012 at [www.usni.org/magazines/proceedings/2010-03/got-sea-control](http://www.usni.org/magazines/proceedings/2010-03/got-sea-control)].

<sup>436</sup> *A Cooperative Strategy for 21<sup>st</sup> Century Seapower*, p. 27.

<sup>437</sup> Such considerations have influenced naval policies and the conduct of naval warfare in the past. Phillip Williams argues that galley warfare in the 16<sup>th</sup> Century was constrained both by the enormous cost of platforms and the difficulty of maintaining experienced crews. See his *Empire and Holy War in the Mediterranean* (I.B. Tauris: London, 2015).

will be reduced. A study of the Libyan campaign prepared by the Royal United Services Institute noted that the Royal Navy had to divert assets from other tasks to cope with operational demands; but in doing so, there were significant opportunity costs and the relatively small operation that Libya represented strained the deployed force.<sup>438</sup> The Royal Navy was able to absorb that strain, if only just, due to the absence of any direct threat to the British Isles. That circumstance might not always prevail. It stands to reason that increased demands for homeland defence will lead to a reduction in the number of naval assets available for overseas operations.

In peace, as in war, there will also be implications. This is particularly so for those countries that use their navies for outreach, either to conduct diplomacy or to reassure allies and partners. With fewer ships, prioritization becomes more necessary and some regions will be favoured over others in terms of where a naval presence is contemplated. This will impact the conduct of foreign policy and defence relations, but it could also have broader strategic implications. As has already been noted, naval presence is a form of signalling, and cutbacks in presence due to a smaller fleet might be interpreted by an adversary in a manner that was never intended. The early-1982 decision to scrap HMS Endurance, a victim of budget cuts, meant that the Falkland Islands were deprived of a Royal Navy presence. As there was no vessel to replace it, Argentine media and officials saw the decision as a deliberate gesture that Britain was no longer interested in the fate of its South Atlantic colony.<sup>439</sup>

One argument frequently voiced in opposition to the need to maintain fleet size is that advanced weapons and sensors reduce the number of naval platforms needed to achieve the same military effect. This holds in certain instances, particularly those missions requiring only a single ship deployment. The argument nonetheless overlooks missions where operational effectiveness requires a multi-ship deployment. An incisive example of this is anti-submarine operations where maritime air assets from more than one ship, often from ships distant to one another, are required to effectively counter the submarine threat.<sup>440</sup> Advanced capabilities on fewer ships cannot alter the fundamental requirements of the task. Indeed, the negative implications of breaking the iron law that links utility of a naval force to numbers of platforms are already evident in the inability of some navies to meet the demands of standing peacetime responsibilities. The Royal Navy is a case in point. The impact of years of downsizing was revealed when it was admitted, at the time of the Libyan operation in 2011 to which Britain had committed a naval force, that there was no warship available to respond quickly to any potential threat that suddenly presented itself in Britain's home waters.<sup>441</sup> And, in late-2014, Britain had to call upon its NATO allies to assist in locating a suspected Russian submarine off the coast of Scotland, due in part to the elimination of

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<sup>438</sup> Royal United Services Institute (RUSI), "Conclusion", *Accidental Heroes; Britain, France and the Libya Operation*, London, September 2011, p. 13.

<sup>439</sup> Sir Lawrence Freedman, *The Official History of the Falklands Campaign, Volume 1: The Origins of the Falklands War* (Routledge: London: 2005), pp. 125–126.

<sup>440</sup> This argument is examined in detail in Maj. Bill Ansell, RCAF, *Canadian Surface Combatant: Helicopter Carrying Capacity* (draft), 9 February 2015, pp. 28–36. I am grateful to the author for supplying me with a copy of his unpublished draft.

<sup>441</sup> "No warships left defending Britain after Defence cutbacks", *The Daily Telegraph*, 1 November 2011.

maritime patrol aircraft in controversial budget cuts four years earlier.<sup>442</sup> The latter action created a strategic capability gap for which no national offset was at that time, or is yet, available.<sup>443</sup>

It is not only the reduction of capabilities available for operations that downsized navies must confront, for the administrative challenge of maintaining a much reduced fleet becomes ever more difficult for naval planners. Longer deployments, a possible consequence of fewer ships, will likely create strains in personnel management including new pressures on retention. In some naval trades, loss of well-trained personnel will impact both an individual ship's performance at sea, but could undermine the resilience of the navy as a whole. Innovative approaches to personnel and training hold out the possibility of mitigating some of the worst effects of downsizing and are being tried out in various navies around the globe. So far, however, the results are inconclusive and perhaps they will remain so for years to come. Reductions in the crew size of the Littoral Combat Ship (LCS) have nonetheless already led to a reconsideration of the relationship between advanced technology and smaller crews.<sup>444</sup>

Last, longer deployments threaten to generate extenuated maintenance cycles that could negatively affect the performance of vessels and their crews. According to a report prepared for the USN, there is no evidence that this will result in increased maintenance demands, but it will shorten the overall service life of ships, and further the downward spiral of a navy.<sup>445</sup> Unexpected repairs to ships or even scheduled maintenance will, therefore, have a proportionally greater (and cascading) impact on a smaller navy that might prove difficult or impossible to redress in the event of a national emergency. The danger is that when a navy has lost critical mass (an assessment that will necessarily be unique to each country), the rationale for the maintenance of what remains could become increasingly difficult to sustain and the cost of recovery politically untenable.

Just as navies will need to more rigorously justify the retention and modernization of capabilities and platforms to a country's political leadership and, ideally, general population, downsizing pressures would seem to urge greater attention be paid to what types of missions the navy is expected to undertake. This automatically raises questions for force development regarding the requirement for highly-specialized platforms versus more mission-specific, and to the trade-offs between capabilities and numbers of platforms. More to the point, while efficiency is likely always going to be endorsed by public institutions, significant cutbacks in fleet size obviously impact the relevance of a navy as an instrument of policy. Alongside resilience in wartime, that is the principal danger posed by fleet reduction.

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<sup>442</sup> Ben Farmer, "Britain forced to ask NATO to track 'Russian submarine' in Scottish waters", *The Daily Telegraph*, 9 December 2014, and Kylie MacLellan, "Britain calls on NATO allies to help in submarine hunt: media", *Reuters*, 10 December 2014.

<sup>443</sup> United Kingdom, House of Commons Defence Committee, *Future Maritime Surveillance, Volume 1: Report, together with formal minutes, oral and written evidence* (HMSO: London, 19 September 2012), p. 23.

<sup>444</sup> Sam LaGrone, "Report: LCS Manning Could Permanently Increase", USNI.org, 24 September 2013 [accessed on 1 December 2014 at <https://news.usni.org/2013/09/24/report-lcs-manning-permanently-increase-2015>].

<sup>445</sup> Congressional Budget Office, *Preserving the Navy's Forward Presence With a Smaller Fleet* (Washington, D.C., March 2015), p. 11.

## 7 Conclusion

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This century will have more of a maritime focus than the last few decades of the 20<sup>th</sup>. As it unfolds, the challenge of maritime security will grow in importance, driven by globalization and the redistribution of power in the international system. How these challenges manifest themselves in coming decades is uncertain. However, we can already discern trends and they leave little doubt that maritime issues will become more politically salient than they ever were in living memory. Over time, it will become increasingly difficult to view concerns about overfishing and deep-sea mining, or the threats of terrorism and piracy, or the systemic challenge posed by some states' interpretation of UNCLOS, as distant. Both national interests as well as national security interests of states, even those far removed from the immediate effects of such developments, will be engaged. While this increased attention to maritime issues might slowly erode the maritime blindness that is so prevalent today, particularly in the Western democracies, it might also intensify disputes that are certain to arise. There will, after all, be more countries with a stake in the outcome of such disputes. As recent history demonstrates, international (both bilateral and multilateral) cooperation will still be possible on some maritime security issues and one can expect that governments will occasionally embrace such efforts. However, many countries outside the Western or liberal-democratic group of states tend towards a realpolitik tradition of statecraft, and embrace a highly competitive view of global affairs that includes a more constrained assessment of the legitimacy and utility of cooperation. When these countries are engaged in maritime disputes, a peaceful resolution cannot always be guaranteed.

The international frictions that are being generated by this evolution in the way that the maritime realm is perceived and used globally will also be directly affected by the shift in power to the Indo-Pacific. In that region, geography and economics will further underscore the strategic significance of maritime strategies and sea power. China's confidence in *re-claiming* what it believes is its rightful status as a Great Power directly challenges the hegemonic role that the US has played in the region since 1945. China's increasing assertiveness and the rapid expansion of its defence capabilities is giving rise to tensions throughout Asia as its ambition clashes with the more status quo-oriented outlook of the US and its regional allies. Washington's strategic rebalance announced in early-2012 is intended to signal a renewed commitment, but is too soon to know if the existing order and its institutions can accommodate the challenge that a rising China represents. The likely mid- to long-term outcome of this competition is greater instability throughout the Asian archipelago and quite possibly armed conflict, with implications for the global balance of power.

The role of navies as instruments of policy will persist and might well grow in importance as governments demand an assortment of options—diplomatic and coercive—to address the maritime-related issues that will confront them. Modern navies will, therefore, continue to require a broad range of platforms and capabilities (i.e., sensors, weapons and logistics) to be combat-effective, but those same capabilities will allow them to signal intent to allies and adversaries, and engage in missions where use of armed force is not needed or desirable. Their flexibility (i.e., deploy for long periods of time with limited outside support) and agility (i.e., rapid transition between roles) make naval vessels ideal in supporting that wide range of possible missions. The ability to protect the sea lines of communication upon which the global economy depends, to exercise sea control and to project power ashore, to deal with security threats and/or to offer humanitarian assistance, will continue to be defining characteristics of navies by

traditional maritime Powers. For rising Powers, the goals they have for their navies are somewhat less certain, but clearly asserting sovereignty, protecting their national interests in the maritime realm, and constraining any intervention contemplated by adversaries (i.e., through a sea denial strategy) will be imperatives. For both, navies could offer governments a more cost-effective means of dealing with threats away from national territory, because sending a ship does not involve the same level of manpower commitment, force protection problems, or logistic tail that army and air assets require; and, with at-sea supply, naval vessels can remain on station for very long periods.

In his most recent work, *The Direction of War*, military historian Hew Strachan advises his readers that strategy must always confront the mismatch of ends and means, “but the problem is particularly acute for a navy precisely because its roles lie across the axis of grand strategy, athwart the line between strategy and national policy.”<sup>446</sup> These considerations are obviously important for the largest navies. For smaller navies, where the margin of error is minimal, a good understanding of the role of strategy is however essential. Maritime strategy, Strachan reminds us, is the means by which a country determines the role that it wants its navy to play in upholding its national interests, and it has the task of ensuring that it acts as a linkage, rather than a fault-line, between strategy and policy.

Given the intensification of ocean politics, that mandate will become increasingly difficult to uphold. Taken together, the issues associated with the maritime realm in the 21<sup>st</sup> century will be more challenging, possibly more complex, and more difficult than those we have faced in recent decades. Even in the absence of large-scale armed conflict, the strain on government resources to address strategic interests in the maritime realm—provided primarily by navies, although not exclusively so—can only increase. While the interests themselves are unlikely to change, their prioritization and the means of addressing them will be subject to political calculation and reconsideration. That is inevitable. Placing a new emphasis on strategy and strategy development could assist governments in wrestling with the challenges, particularly in cases where the latter has always been more *ad hoc* in nature. Strategy creates a coherent relationship between and among objectives, resources and timescales, and should assist in avoiding the arbitrary decision-making of bureaucratic processes that can create serious vulnerabilities years later. It cannot provide all the answers or guarantee that the ones it provides are proven correct. But as British theorist Colin Gray has written, the key to success in strategy-making “is not an all but magical ability to avoid errors, but rather an ability to adapt to unexpected challenges, including those produced by one’s own previous misjudgements.”<sup>447</sup> As ocean politics intensify, that is probably the most we ought to expect.

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<sup>446</sup> Strachan, *The Direction of War*, p. 151.

<sup>447</sup> Colin S. Gray, *Strategy and Politics* (Routledge: London, 2016), p. 1.

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Drawing upon a wide array of primary and secondary sources, this report concludes that maritime issues will be increasingly prominent as the current century unfolds and likely far more so than the last decades of the 20th. Increasing exploitation of marine resources and reliance on the maritime realm to sustain populations and to support socio-economic development are leading to an entwining of ecological stresses and political frictions. Efforts to regulate the ensuing tensions will often become, as they have been, contentious. These developments, which will be further magnified by the shift in power to the Indo-Pacific region (particularly the rise of China and Sino-US competition) as well as many uncertainties regarding the opening of the Arctic region, are underscoring the strategic significance of the ocean space. As a result, naval power will retain its strategic significance. Being an agile instrument of national power in order to deal with security threats and/or to conduct diplomatic and constabulary missions will continue to be the defining requirements of modern navies. While the strategic objectives of seapower remain unchanged, the maritime operating environment will be most likely focussed on the littorals where human social and economic activity is intensifying and state and non-state actors will be operating with increasingly sophisticated capabilities. Modern navies require a broad range of platforms and capabilities to be combat-effective, but the proliferation of such technologies will substantially increase the level of risk to ships and crews, creating additional challenges to many fleets that have already experienced significant reductions.

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En mettant à profit un large éventail de sources primaires et secondaires, le présent rapport permet de conclure que les enjeux maritimes occuperont une place de plus en plus importante au fur et à mesure que nous avançons dans le siècle actuel, et probablement de loin davantage qu'au cours des dernières décennies du XX<sup>e</sup> siècle. L'exploitation croissante des ressources de la mer et la dépendance envers le monde marin pour nourrir des populations et contribuer au développement socioéconomique sont à l'origine d'une situation où stress écologique et frictions politiques s'entrecroisent. Comme par le passé, les efforts visant à régler les tensions qui en découlent susciteront souvent la controverse. Ces rebondissements, amplifiés davantage par le glissement du rapport des forces vers la zone indo-pacifique (notamment l'ascension de la Chine et la rivalité sino-américaine) et par une grande incertitude quant à l'ouverture de la région arctique, mettent en évidence l'importance stratégique de l'espace océanique. Par conséquent, la puissance navale conservera son importance stratégique. La marine moderne sera encore tenue d'être un instrument pratique de la puissance nationale pour faire face aux menaces à la sécurité ou pour effectuer des missions diplomatiques et policières. Certes, les objectifs stratégiques de la puissance maritime demeurent inchangés, mais il est plus probable que le milieu opérationnel maritime soit axé sur les littoraux où l'activité humaine, sociale et économique s'intensifie, et où les acteurs étatiques et non étatiques œuvreront avec des capacités de plus en plus sophistiquées. La marine moderne exige une vaste gamme de plateformes et de capacités pour être efficace au combat, mais la prolifération de telles technologies fera augmenter considérablement le niveau de risque encouru par les équipages et les navires, créant de nouveaux défis pour de nombreuses flottes qui ont déjà été l'objet de réductions importantes.

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